Interim Report
Critical Path Recreation Field Studies

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List of Acronyms

ADA	Americans with Disabilities Act
ALP	Alternative Licensing Process
DWR	Department of Water Resources
FERC	Federal Energy Regulatory Commission
LOSRA	Lake Oroville State Recreation Area
OWA	Oroville Wildlife Area
PAOT	Persons at one time.
PME	Protection, mitigation, and enhancement
SVRA	State Vehicle Recreation Area

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1.0 INTRODUCTION/BACKGROUND

1.1 PURPOSE

The purpose of this report is to summarize progress and interim results of three recreation studies being conducted in support of relicensing the Oroville Facilities, licensed by the Federal Energy Regulatory Commission (FERC Project #2100). The Oroville Facilities are managed by the California Department of Water Resources (DWR) for the purposes of water supply, flood control, hydropower generation, and public recreation use. The FERC license for this project expires February 1, 2007, and the relicensing process was initiated in June 2000; the first public meeting for this project was held in Oroville in the same month.

DWR decided to use an alternative licensing procedure (ALP) that involves a collaborative planning effort with local entities, state and federal agencies with mandatory conditioning authority, Native American tribes, and local and regional interests. The Department and Stakeholders initiated this collaborative process by holding the first workgroup meetings in December 2000. Each major resource category (e.g., Environmental, Engineering and Operations, etc.) has a corresponding Work Group that collaborate with DWR on relicensing issues, the scope of resource studies, and ultimately protection, mitigation and enhancement measures (PM&Es). Within each Work Group, task forces are occasionally established on an ad hoc basis to deal with different issues, such as study plan development. Through this collaborative process more than 70 study plans were developed and approved, with study implementation for the earliest studies occurring in spring 2002.

Nineteen of these study plans involve recreation and socioeconomic issues, and this Interim Report provides a status update of the Recreation Surveys Study (SP-R13), the Existing Recreation Use Study (SP-R9), and the Reservoir Boating Study (SP-R7). These studies are considered “critical path” studies since they supply essential data to the other sixteen recreation and socioeconomic studies (see Section 2 for more detail). These studies were initiated on Memorial Day weekend, May 2002, and will end in June 2003. Most results are based on data collected Memorial Day weekend through September. Trail use data for the existing recreation use study were collected from late August through November.

Although the respective study plans mention separate interim report for each recreation critical path study (SP-R13, SP-R9, and SP-R7), all three have been combined here into a single report due to considerable overlap in the timing, methods used, data collected, and study area visited. This report is organized in the following manner:

- Section 1 provides the background information for each study;
- Section 2 describes study objectives for each critical path study;
- Section 3 contains methods, and;
- Section 4 contains results for each.

In Section 2 the study objectives are further divided to represent the three individual studies: Recreation Survey deliverable (Section 2.1), Existing Recreation Use Study deliverable (Section 2.2), and Reservoir Boating Study deliverable (Section 2.3). This organizational scheme also applies to Sections 3 and 4.

1.2 BACKGROUND FOR CRITICAL PATH RECREATION STUDIES

1.2.1 Recreation Surveys Study (SP-R13)

Study SP-R13 involves conducting a number of recreation surveys. FERC regulations require a comprehensive recreation plan, and specify that a "well documented user survey is an essential part of a good recreation plan" (FERC 1996). Recreation surveys are an integral part of most hydropower relicensing recreation studies; for this project they are also being used to collect information addressing the objectives of many of the nineteen different recreation and socioeconomic studies. These surveys gather recreation use information, perceptions of crowding and safety issues, recreation preferences, overall trip satisfaction, and economic expenditure information from reservoir boaters, anglers, and trail users, all from both day use and overnight visitors. This study also involves collecting a statistically valid number of completed surveys from nineteen different recreation activity groups, described in more detail in Section 3. A market analysis of other similar recreation sites in northern California and an assessment of unmet demand relative to water-based recreation in northern California are also included in this study.

1.2.2 Existing Recreation Use Study (SP-R9)

Study SP-R9 quantifies and describes existing recreation use (both day and overnight use) within the Study Area. This study complies with FERC regulations requiring estimates of existing and future recreation use at the project in terms of both daytime and overnight visitation, as well as a description of the methods used to estimate use (Subpart F, Section 4.51 of 18 C.F.R.).

1.2.3 Reservoir Boating Study (SP-R7)

Study SP-R7 focuses on reservoir boating. Boating is a major recreation activity in the Study Area, and is directly affected by project operation, particularly reservoir pool levels. This study measures the adequacy of existing recreation facilities, opportunities, and access to accommodate current use and future demand. Additionally, this study assesses the impact of project operations on specific recreation activities and identifies relationships between recreation area management, fish and wildlife management, and reservoir boating.

1.3 ISSUES ADDRESSED BY CRITICAL PATH RECREATION STUDIES

Through a consensus-based approach, recreation and socioeconomic issues were developed and then consolidated through a collaborative effort into several summarizing Issue Statements. There were about 150 specific issues identified, and the six recreation-related Issue Statements became:

- R1—adequacy of existing project recreation facilities, opportunities, and access to accommodate current use and future demand
- R2—adequacy of public safety at Oroville Project recreation facilities
- R3—adequacy of future and reliable funding sources for recreation development
- R4—adequacy of maintenance and clean-up activities associated with recreation areas
- R5—appropriate recreation funding, development and management structure
- R6—appropriate management of fish and wildlife resources to provide recreation opportunities

A major issue for many stakeholders involved in this project is whether existing project recreation facilities can accommodate current and future recreation use. For the purpose of this report, the three critical path field studies all focus on Issue Statement R1—adequacy of existing project recreation facilities, opportunities, and access to accommodate current use and future demand. Approximately half of the recreation-related issues originally identified were associated with R1. These individual issues include both general and specific items such as “improve Loafer Creek facilities,” “increase camping facilities,” and “provide more parking at Bidwell Canyon.”

Information from these critical path studies is needed to meet data needs for many of the other recreation and socioeconomic studies. The entire list of this Resource Area’s studies is as follows:

- SP-R1—Public Vehicular Access Study
- SP-R2—Recreation Safety Study
- SP-R3—Project Operations Impacts to Recreation Study
- SP-R4—Fish and Wildlife Management
- SP-R5—Recreation Area Management
- SP-R6—ADA Compliance
- SP-R7—Reservoir Boating
- SP-R8—Carrying Capacity
- SP-R9—Existing Use
- SP-R10—Recreation Facility Condition Inventory
- SP-R11—Recreation and Public Use Impact Assessment
- SP-R12—Projected Recreation Use
- SP-R13—Recreation Visitor Surveys

- SP-R14—Regional Recreation Assessment and Barriers to Recreation
- SP-R15—Recreation Suitability
- SP-R16—River and Whitewater Boating
- SP-R17—Recreation Needs
- SP-R18—Recreation Economic Impacts
- SP-R19—Fiscal Impacts

2.0 STUDY OBJECTIVES

The overall objective of each of the three critical path recreation studies is to address Issue Statement R1—adequacy of existing recreation facilities, opportunities, and access to accommodate current use and future demand. This information will help determine user preferences, attitudes, levels of satisfaction, perceptions of crowding, and reasons for visiting or not visiting the Study Area, with the ultimate goal of providing recommendations on protection, mitigation, and enhancement measures (PM&Es) that will be included in the Project's next Recreation Plan.

2.1 OBJECTIVE OF RECREATION SURVEYS STUDY (SP-R13)

The Recreation Surveys study (SP-R13) determines user preference for facility and area development, perceptions of crowding, levels of satisfaction, reasons for visiting the area, and background characteristics (visitors' activities, trip characteristics, and socio-demographic characteristics). Group-size information facilitates reliable interpretation of long-term traffic data. The study also gauges latent demand for recreation activities in the Lake Oroville Area and its relative importance compared to other similar recreation destinations in northern California. Surveys of visitors to similar recreation sites at other northern California reservoirs provide context and opportunity for comparison with Project Area survey results. These also provide information on visitors to other site's knowledge and opinions of the Project Area. A telephone survey of households within and outside Butte County is to measure interest in recreation within the Study Area and in various development scenarios that may motivate them to visit the Study Area. The study provides data for recreation studies SP-R2, 3, 4, 5, 8, 12, 14, 16, 17, and 18.

2.2 OBJECTIVE OF EXISTING RECREATION USE STUDY (SP-R9)

The Existing Recreation Use study (SP-R9) estimates and describes existing project-related recreational use (both day use and overnight use) at recreation facilities and dispersed recreation use areas, and focuses on activities within the Study Area. It includes a description of the methods used to estimate use, as required by FERC regulations (Subpart F, Section 4.51 of 18 C.F.R.). Information from the existing use study is used to estimate weekday and weekend use, as well as persons at one time (PAOT) for specific areas and times of the year. This study provides information about use levels as an input to a comprehensive recreation plan for the area, as well as information necessary for other recreation studies. Current information on existing recreation use within the Study Area will be used to identify trends in use, discuss methods of collecting data, and detect any shortcomings from previous studies. Data for reliable interpretation of long-term traffic patterns will also be provided for specific sites through the collection of group-size information. The study provides data for recreation studies SP-R8, 12, 14, 17.

2.3 OBJECTIVE OF RESERVOIR BOATING STUDY (SP-R7)

The main objective of the Reservoir Boating study (SP-R7) describes existing boating use and water surface management on Lake Oroville and other water bodies within the Study Area. The study results will be used to determine existing use levels for boating and to help determine if any water surface management changes are needed. Data from the Recreation Facility and Condition Inventory (SP-R10) will be used to assess boating infrastructure. Data from the Recreation Surveys Study (SP-R13) will be used to assess boaters' perceptions of boating conditions. Surface water boating capacity will be analyzed in conjunction with study SP-R8 (Carrying Capacity Study). The study will provide data for recreation studies SP-R2, 3, 4, 5, 6, 8, 9, 10, and 12.

3.0 STUDY METHODS

Section 3.1 identifies the overall study area; Section 3.2 describes data collection instruments, sampling protocols, and survey administration procedures for the recreation visitor survey (SP-R13); Section 3.3 describes data collection instruments and a schedule of sites visited for the existing use study (SP-R9); and Section 3.4 describes data collection instruments and a sampling protocol for the reservoir boating study (SP-R7).

3.1 THE STUDY AREA

The Study Area (Figure 1) for all recreation critical path studies includes Lake Oroville, the lands and waters within and adjacent to (1/4 mile) the FERC project boundary, and adjacent lands, facilities, and areas with a clear project nexus. In a series of collaborative work sessions with the Study Plan Development Task Force, sampling locations were determined and include the sites listed below:

Campgrounds

Bidwell Canyon Campground
Bloomer Cove Boat-In-Campsite (BIC)
Bloomer Knoll BIC
Bloomer Point BIC
Bloomer Group BIC
Craig Saddle BIC
Foreman Creek BIC
Goat Ranch BIC
Floating Campsites
Lime Saddle Campground
Lime Saddle Group Campground
Loafer Creek Campground
Loafer Creek Group Campground
Loafer Creek Horse Campground
North Thermalito Forebay
Oroville Wildlife Area (OWA) Primitive Campgrounds

Day Use Areas (DUAs)

Riverbend Park

Lime Saddle DUA

Bidwell Canyon DUA

Loafer Creek DUA

Oroville Dam Overlook Area

Spillway DUA

Thermalito Diversion Pool

Oroville Wildlife Area

Saddle Dam Trail Access DUA

North Thermalito Forebay DUA

South Thermalito Forebay DUA

Thermalito Afterbay (off Hwy. 162)

Thermalito Afterbay (Wilbur Road)

Thermalito Afterbay (Larkin Road)

Lakeland Blvd. Trail Access DUA

Boat Launches

Lime Saddle Boat Launch Area (BLA)

Loafer Creek BLA

Bidwell Canyon BLA

Enterprise BLA

Nelson Bar CTA

South Thermalito Forebay BL

Thermalito Diversion Pool CTA

Oroville Wildlife Area

Foreman Creek Car Top Area (CTA)

Dark Canyon CTA

Stringtown CTA

Vinton Gulch CTA

Thermalito Afterbay BL

North Thermalito Forebay BL

Riverbend Park BL CTA

Other Recreational Facilities with Project Nexus

Lime Saddle Marina

Floating Restrooms

Feather River Hatchery

Clay Pit SVRA

Bidwell Canyon Marina

Brad P. Freeman Trail

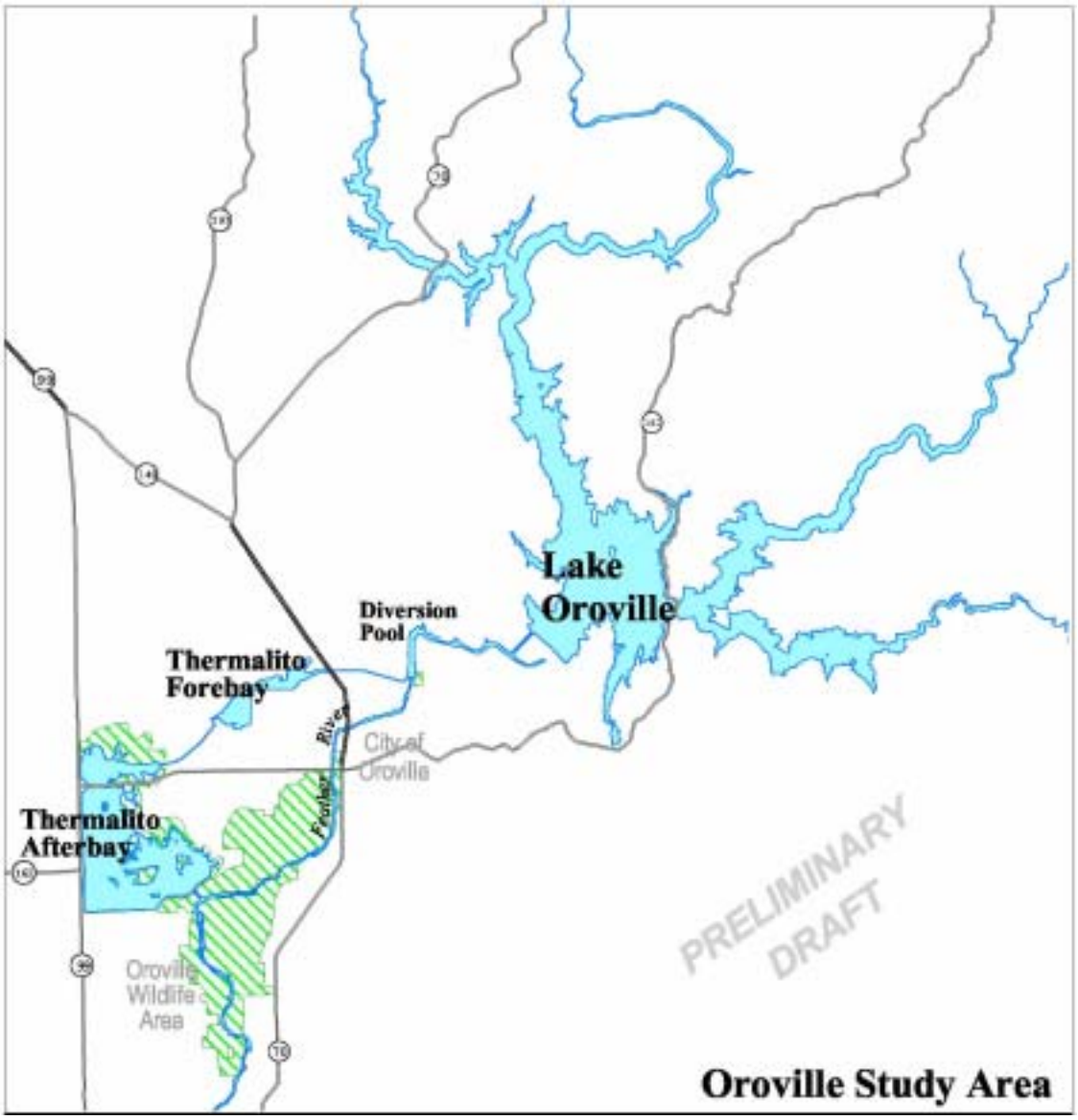
Lake Oroville SVRA

Model Airplane Flying Area

Lake Oroville State Recreation Area (LOSRA) Hiking/Equestrian Trails

Dispersed use areas—(upstream and downstream) reaches of Feather River

Figure 1. Oroville Study Area



3.2 RECREATION SURVEY STUDY METHODS

This section describes the content and purpose of each survey in Study SP-R13. Surveys are being used to collect data on-site at the study area and via a mailback survey. Additionally, data were collected from recreationists at three other similar sites during summer 2002, and from households throughout northern California via a telephone survey. Copies of each survey are presented in Appendices A, B, C, and D, respectively.

3.2.1 Survey Data Collection Instruments

3.2.1.1 On-site Surveys (on-going)

The overall purpose of the on-site survey is to obtain visitors' first impressions of trip-related attributes that may fade or change over time, such as perceptions of crowding. This survey elicits information on visitors' general trip characteristics, their perceptions of crowding, and attitudes regarding visual quality at the site where contacted. Visitors are asked to recall at-risk recreation experiences and conditions in particular, as well as any other general comments about their trip. In addition, the on-site survey contains three activity-specific sections for anglers, reservoir boaters, and trail users. Instructions for each of these sections indicate that visitors should respond only for activities that they are engaged in during their current visit to the Study Area. Socio-demographic questions are also asked to determine age group, occupation, total household income, and ethnic group association.

3.2.1.2 Mailback Surveys (on-going)

The purpose of the mailback survey is to gather information about visitors' perceptions of the Lake Oroville area that are not time or site dependent, such as general impressions of the area's recreation facilities. Also included are questions related to the visitors' total

trip expenditures. The mailback survey elicits information on problems encountered during the trip, perceived adequacy of recreation facilities, and trail preferences and conditions. The first two sections of the survey ask the respondents to rate their responses both in rank numerical order and with interval type questions.

To support the objective of the Recreation Economic Impacts study (SP-R18), a separate section on economic expenditures was included in the mailback survey. These questions were listed in four parts:

- Part A—Transportation and accommodations, including mode of transportation and overnight accommodations
- Part B—Equipment used for recreation on that specific trip, including boats and/or other watercraft, camping vehicles, trailers, motorized or non-motorized bikes, and camping and hiking or trail use equipment
- Part C—Expenditures encountered from start to finish of that specific trip, including a list of goods and services purchased and the amount spent, assisted by an explicit list of possible expenditures incurred
- Part D—Recreation activities and experiences on that specific trip.

The respondents are also asked if there were recreation activities or special events not offered in the Lake Oroville area that should be offered. A list of other recreation places in northern California and northern Nevada is available for respondents to check all areas visited within the past 12 months. Questions related to experience are asked to determine the importance of solitude and other aesthetic issues and values.

3.2.1.3 Windshield Surveys (On-Site Visitor Survey, on-going)

The windshield survey is identical in content to the on-site survey. The cover provides an introduction stating “Sorry we missed you” and additional instructions that are normally given to visitors verbally on-site. It is primarily used to gather responses from visitors at low-use sites who have left vehicles unattended, and also from those asked to participate at an awkward time, such as boaters departing the lake at dusk. A postage-paid return envelope and a Project Area map with instructions related to the follow-up mail survey are placed with the windshield survey booklet.

3.2.1.4 Hunter Surveys (on-going)

A survey specific to hunters was developed to assess attitudes, preferred species and hunting locations. This on-site survey is divided into 3 parts: Part 1 asks for a general description of the visit and past use of the area. Part 2 requests information about use of the Oroville Wildlife Area specifically, and perceptions related to the hunting experience such as species and number taken. Part 3 includes confidential information regarding level of education, age, occupation, total household income, and ethnic affiliation.

3.2.1.5 Visitors to Similar Northern California Recreation Areas (completed)

The purpose of the similar recreation areas surveys is to determine how visitors to Lake Berryessa, Black Butte Reservoir, and Shasta Lake rated their experiences at these sites. This information is compared to responses of visitors at the Lake Oroville area, and helps fulfill the market analysis purpose of SP-R13 described in Section 2. A secondary purpose is to determine the level of awareness of and interest in visiting the Lake Oroville area among similar sites visitors, and the types of facilities and special events that might interest them. These surveys also provide barrier-related information

for Study SP-R14 (Regional Recreation Assessment and Barriers to Recreation). Some of the major topics in the survey include: general visitor characteristics, reasons for visiting the site, recreation activity participation, visual appearance of the area where the visitor was contacted, level of satisfaction with the trip and likelihood of making a return trip, perceptions of on-water crowding and safety issues, problems encountered on the trip, and adequacy of recreation facilities.

3.2.1.6 Household Telephone Survey (completed)

The purpose of the household survey is to estimate latent (unmet) demand for recreation special events and facilities that currently are not offered in the Lake Oroville area (Study Area) among northern Californians and residents of northern Nevada. Some of the major topics in the survey include: other water oriented recreation sites visited in northern California, whether or not the respondent had visited the Lake Oroville area, previous trip satisfaction, types of special event and facilities that could increase visitation to the Study Area, and socio-demographic characteristics.

3.2.2 Sampling Protocols

3.2.2.1 Major Target Recreation Groups and Activity/Location Specific Groups

Sampling protocols were developed to ensure representation from several major target recreational groups. Efforts to determine which groups should be targeted, as well as how many completed surveys would constitute adequate representation, were discussed at length during the Study Plan development phase and again prior to beginning data collection in June 2002. The target groups are as follows:

- Recreational visitors who visit the Study Area primarily for angling
- Recreational visitors who visit the Study Area primarily for reservoir boating
- Recreational visitors who visit the Study Area primarily for river boating

- Recreational visitors who visit the Study Area primarily for trail use

The first three target groups are typically sampled for recreation studies conducted in support of FERC relicensing projects. The trail user target group is somewhat unique to the Oroville project, and is important since a number of trails within the Study Area pass through the City of Oroville and various recreation areas. Table 3.1 shows the desired sample size for each target group.

Table 3.1 Sample Ranges of Completed Surveys and Associated Error Ranges

Target Group	Range of # Completes	Error Range
Recreation visitors to the Study Area[1]	1300 to 2000	+/- 9% to 2.5%[2]
Includes Reservoir Boaters	200 to 300	+/- 6.8% to 5.6%
Includes River Boaters	100 to 200	+/- 9.8% to 6.8%
Includes Anglers	200 to 300	+/- 6.8% to 5.6%
Includes Trail Users	100 to 150	+/-9.8% to 8.0%

1 This figure refers to number of respondents who completed both the on-site and the mailback surveys, and does not include those who participated in the on-site survey only.

2 Error rate is intentionally set lower for this group, since there will be additional analyses on smaller subgroups representing different recreation activities.

During the collaborative process used to develop study plans, stakeholders raised questions about the representativeness of the above-mentioned sampling scheme relative to all the activities that occur within the Study Area. As a result an additional "layer" of sampling requirements was imposed on the critical path study plans. This additional requirement involves obtaining 100 completed surveys from a combination of recreation areas, activities and seasons. The nineteen activities/locations/season groups are listed below by primary season of use:

<u>Year-Round Recreation Use:</u>

- Anglers at the Afterbay
- Anglers at the Forebay
- Feather River anglers (seasonal)

- Anglers at Lake Oroville
- Trail users

April to October Recreation Use:

- Swimmers at the Forebay
- Miscellaneous day use at the Forebay, Afterbay, Diversion Pool, and Lake Oroville
- Campers at the Oroville Wildlife Area
- Campers at the drive-in campsites on Lake Oroville
- Picnickers

Memorial Day through Labor Day:

- River boaters below Oroville Dam
- Reservoir boaters
- Campers at boat-in and floating campsites
- Swimmers at Lake Oroville
- Swimmers in the Feather River

Fall/Winter/Groups Surveyed via Self-Administered Questionnaires:

- Other boaters, including kayakers, sail boaters, and water skiers
- Anglers during the off-season (fall and winter)
- Interpretive/educational visitors
- Hunters, concentrating on opening day or opening day weekends, i.e., hunters for waterfowl and upland game

3.2.2.2 Similar Sites Sampling Protocol

On-site surveys were also completed at three other reservoirs in northern California: Lake Berryessa, Black Butte Reservoir, and Lake Shasta. The sampling objective for

each of these sites was to obtain 100 completed surveys. Sampling occurred at each site on at least two weekend days in July and August 2002. Sampling objectives were met at Lake Berryessa and Lake Shasta. At Black Butte Reservoir 77 completed surveys were obtained after an additional day of weekend sampling.

3.2.2.3 Household Sampling Protocol

The overall goal of the household sampling efforts was to obtain 400 completed surveys within northern California and northern Nevada. The sampling objective was to obtain 100 completed surveys in each of 4 strata representative of major visitor origins for the Lake Oroville area. The 4 strata included: the San Francisco Bay area, the Sacramento area and surrounding communities, Butte County, and Washoe County, Nevada (city of Reno and surrounding communities). Sampling via telephone interviews occurred during the last week in June and first week of July 2002. Sampling occurred from 12 noon to 9 pm. The overall sampling goal and the sampling objective for each stratum were met.

3.2.3 Survey Administration

While conducting on-site surveys, the research team completes visitor survey log forms. The forms are used to record the number of visitors who agreed to fill out an on-site survey, the number who refused to participate, the number of windshield surveys left for visitors, and the number of visitors who had been previously contacted.

3.2.3.1 Oroville On-site Survey

Initially, visitors are asked to participate in the survey effort by filling out a questionnaire on-site. In order to participate in the study, visitors must be recreating at the site where they were contacted for at least 30 minutes. Visitors who agree to participate are asked

to fill out a self-administered survey that required about 15 minutes for completion. The survey also contains a section that encourages the visitor to submit comments regarding their visit. Visitors were given DWR promotional floating key chains, lanyards, and maps as an outreach effort and an incentive to participate.

Respondents are told about a single follow-up survey that may be mailed to them to determine their total trip expenditures and additional recreation condition perceptions. If visitors agree to participate in the follow-up survey, they provide their names and addresses on the on-site survey form for entry into a master list for mailing following the completion of their trip. The completed on-site surveys are divided into Butte County residents and non-residents for database entry. The Butte County resident distinction is needed to allow for estimating economic impacts to the Study Area, which is located within Butte County. Visitors are also given a map, with a note on the reverse to instruct them and remind them about the follow-up survey to be mailed.

Windshield surveys are left on unattended vehicles at recreation sites with low visitor use. The windshield survey includes a cover letter stating “Sorry we missed you” and a map, as well as a stamped and addressed envelope for mailing. Windshield surveys are also left regularly at pre-designated areas, such as trailhead access areas, car-top boat launch areas, at the State Vehicle Recreation Area (SVRA), and Oroville Wildlife Area (OWA) sites where direct contact with visitors is difficult. Windshield surveys are also offered as a last attempt to convince reluctant respondents to participate in the study. This procedure is especially helpful with reservoir boaters, as they are often occupied with the tasks involved in removing their boats from the water and frequently request the opportunity to participate at a later time. These surveys are also divided into resident or

non-resident of Butte County for data entry to meet study requirements for the Recreation Economic Impact Study (SP-R18).

3.2.3.2 Oroville Mailback Follow-up Procedures

Mailback surveys are used as a follow-up to the on-site survey to obtain information that can only be accurately completed after a study participant had ended his or her trip. As a result, the research team does not give the mailback surveys to respondents on-site. Instead, the team mails the follow-up surveys to the addresses given on the on-site forms. In addition to this mailing, several follow-up efforts are conducted. One effort involves sending postcard reminders approximately ten days after the initial mailing to all respondents, regardless of whether they have returned their survey. This postcard instructs non-respondents to complete and return their surveys as soon as possible, and thanks those individuals who have already completed and returned their surveys. Another postcard is sent to individuals who returned the mailback surveys but did not answer the question about their party size. Party size information is essential to accurately estimate per capita spending for the economic impacts study (SP-R18). Finally, a second mailback survey is sent to all non-respondents approximately three weeks after the initial survey mailing.

3.2.3.3 Telephone Procedures

Random-digit dialing was used during late June and early July 2002 to identify households within four strata within northern California and Nevada. Strata were developed to accurately represent the areas of origin for the majority of the visitors to the Lake Oroville area. One stratum included the San Francisco Bay area, another included the Sacramento area and surrounding communities, the third included Butte County, and the last included Washoe County, Nevada (includes Reno and surrounding

communities). Once a household was identified within one of the four strata, the respondent was asked if they were willing to participate in a recreation study about rivers and lakes in northern California. Respondents had to be at least 18 years old, have lived in northern California or Nevada for at least six months, and have participated in water-oriented recreation for at least three days in the last year. If the respondent met these criteria and agreed to participate, the telephone interview was initiated.

3.3 EXISTING USE STUDY METHODS

3.3.1 Observational Data

On days that use is monitored, the field staff conduct a series of person and vehicle counts upon arrival to each site, including equipment (e.g., boat trailers), and observed whether or not the facility in question is below, at, or exceeding capacity, as well as any recreation activities in progress. Notation was made regarding weather conditions, weekday or weekend visitation and shift times. Manual traffic counts were conducted periodically at sites that have traffic counters, for validation purposes, and regularly at sites without traffic counters. Infrared trail counters are also used at selected trail locations. These data are used to estimate seasonal use.

3.3.2 Traffic Counter Data

Visitation is estimated primarily by utilizing data from traffic counters located at each major recreation site, and from observations made regarding the average number of visitors per vehicle at each recreation site. While the majority of use counts are derived from DWR traffic count data, selected sites were chosen to be observationally counted by the research team to help validate and update data obtained from previous counts. Vehicles are counted traveling in both directions and the number of people recorded for

each vehicle. Visitation (units in recreation-days) is described as a visit by one person to a recreation area for any portion of a single day.

3.3.3 Infrared Trail Traffic Counters

Infrared traffic counters are located near four trailhead access areas; the information is then downloaded to estimate seasonal trail use in these select areas. Two were located in the Loafer Creek area, one was located in the Bidwell Canyon Area, and one was on the Dan Beebe Trail near Oro Dam Boulevard. The counters store in their memory one count each time a trail user (hiker, biker, horse) crosses the infrared beam. The counters can be programmed to record in their internal memory hourly or daily counts; all are currently programmed to record hourly data. The counters were recently re-deployed to other points on local trails, to increase the number of trail segments for which data will be available.

3.4 RESERVOIR BOATING STUDY METHODS

3.4.1 Boat Counts

To assess boating use levels, Lake Oroville was divided into six segments: One segment includes the West Branch, and a second includes the North Fork above the confluence with the West Branch. The third segment includes the North Fork from the confluence to Foreman Creek. The fourth segment includes the main basin of the reservoir, south of Foreman Creek to the dam. The fifth and sixth segments are comprised of the Middle and South Forks to the east of the main basin. Boating use levels are also being assessed on the Diversion Pool, North Thermalito Forebay, South Thermalito Forebay, and the Thermalito Afterbay. Boating use is assessed by watercraft types (power boats, personal watercraft, sailboats, houseboats, non-motorized).

3.4.2 Boater Survey Instrument

The Oroville on-site survey instrument contains three sections pertaining to specific activities, including boating. The boating section is to be completed only by study participants that are currently participating in boating on the trip when contacted by the recreation research team. The purpose of this portion of the survey is to obtain time-dependent information from boaters while they are still recreating or just completing their recreation visit at Lake Oroville. This “boaters only” section contains questions about perceptions of water crowding, and at-risk boater behavior. It also contains questions about where the study participant launched his or her boat, if there was a waiting time to launch the boat, and other background characteristics relevant to boaters.

4.0 RECREATION VISITOR SURVEY RESULTS

4.1 RECREATION SURVEY RESULTS

4.1.1 Oroville Area Visitor Survey Results

These results are based on preliminary analysis of data from 1,276 completed on-site survey booklets and 858 completed follow-up mail survey booklets sent to all on-site survey respondents who provided an address.

The total number of responses to each question varies for several reasons. First, some questions for which responses are reported here were in the on-site survey booklet, while others were in the mail survey booklet, which fewer visitors completed. Second, a certain number of respondents did not answer individual on-site and mailback survey questions. Third, visitors were instructed to skip on-site survey sections focused on boating, angling, and trail use if they were not going to boat, fish, or use trails during their current visit.

Response percentages may not total to 100% due to rounding error. Multiple responses were permitted for some questions, in which case response frequencies and percentages are not totaled.

4.1.1.1 Descriptive Profile

This section contains survey results that describe visitors' general pattern of use of the Oroville Area and that describe their current visit to the Oroville Area (the visit during which they were surveyed on-site).

Visit Frequency

Visitors were asked to categorize themselves as regular, occasional, infrequent, or first-time visitors. A large majority of visitors categorized themselves as "regular" visitors, which was defined within the survey booklet as someone who visited 3 or more times per year. Just over 11% of visitors were on their first visit to the area.

Table 4.1 Frequency of Visits to the Lake Oroville Area

	Frequency	Percent
Regular visitor (3+ visits/year)	802	70
Occasional visitor (1-2 visits per year)	174	15
Infrequent visitor (<1 visit/year)	39	3
First time visitor	131	11
Total	**1,146**	**100**

Length of Current Visit

Visitors were asked for the date they arrived at the Lake Oroville Area and the date when they expected to leave the area. Nearly two-thirds of the visitors surveyed were day users making single-day visits. Among the remaining 36 percent of visitors who were visiting for at least 2 days, the greatest number were visiting for 2 or 3 days (often from a Friday to Sunday), but nearly as many were visiting 4 or 5 days. The average length of visit was just over 2 days (2.32). The average length of overnight visits was slightly less than 5 days (4.75).

Table 4.2 Length of Current Visit to the Lake Oroville Area

	Frequency	Percent
1 day visit	685	64
2-3 days	164	15
4-5 days	135	13
6-7 days	30	3
>7 days	52	5
Total	**1,066**	**100**
Mean length of visit: 2.3 days		

Seasons Visited the Area

Visitors were asked which seasons they had visited the Lake Oroville Area during the last 12 months, including their current visit. As expected, summer was the season in which most visitors (89%) reported using the area. (If the intent of the question is strictly adhered to, we can state that more of the visitors visited during the summer since almost all of these survey contacts were made during the summer. However, some first time visitors apparently believed the question related only to past use and did not apply to them, and so may not have answered the question correctly.) About 55% of visitors indicated they had visited in the spring, 41% had visited in the fall, and 29% in the winter.

Table 4.3 Seasons of Visits to the Lake Oroville Area

	Frequency	Percent
Spring	701	55
Summer	1,133	89
Fall	520	41
Winter	364	29

Group Size and Adult/Children Makeup

Visitors were asked to state the number of adults and children in their group visiting the Lake Oroville Area. The most common group size was 2 people, with slightly more than half of visitors were in groups of 2 to 5. Nine percent of groups were single individuals. About 60% of the groups included at least one child, and nearly half of the groups included 2 or more children. The mean number of adults in groups was slightly less than 4 (3.77), the mean number of children was slightly more than 2 (2.32), and the mean group size was about 6 people (6.09). About 5% of visitors indicated they were part of a group of more than 20 people and several described groups larger than 50 people. Some of these largest groups may be more accurately described as several combined groups who probably arrived separately and in different vehicles but met on site to boat

or picnic together. Others may have been large groups traveling and recreating as one unit such as church groups, scout groups, or tour bus groups.

Table 4.4 Group Size, Adults, Children for Groups Visiting the Lake Oroville Area

# of Adults	(% of groups)	# of Children	(% of groups)	Group Size	(% of groups)
0 adults	<1	0 children	40	----	---
1 adult	15	1 child	12	1 person	9
2-5 adults	65	2-5 children	36	2-5 people	55
>5 adults	20	>5 children	12	>5 people	36
Total	**100**		**100**		**100**

Mean number of adults: 4.3, Mean number of children: 2.6
Mean total group size: 6.9 people

Note: Calculations of the percentages of groups in each size category and of mean numbers of adults, children, and total people in groups included several values >20 and as high as 60 children, 100 adults, and 120 people in the group. These are likely to be church groups, scout groups, or tour bus groups, etc. which are not typical of most groups visiting the area in terms of group size.

Primary Activity during Current Trip to Lake Oroville

From a list of 42 activities, visitors were asked to indicate which was/would be their primary activity during their current visit. Responses were well distributed, with no activity accounting for more than 16% of responses. However, the top four activities—swimming, motorboating, bank fishing, and waterskiing/wakeboarding—were specified by at least 10% of visitors, and together account for about one-half of the visitors surveyed (48.7%). Adding the next seven activities, each representing the primary activity for 3-8% of visitors, captures the primary activities of about three-fourths of the respondents. The remaining 31 activities in the survey booklet were each identified as the primary activity by fewer than 15 of the 1,165 visitors who responded to the question.

Clearly, the most common primary activities are water-dependent activities. In addition, those who listed non-water-based primary activities (e.g., relaxing, picnicking, tent camping) were often pursuing those activities on the water or shoreline.

Table 4.5 Primary Activity During Current Visit to the Lake Oroville Area

	Frequency	Percent
Swimming	183	16
Motorboating	156	13
Bank fishing	122	11
Waterskiing/wakeboarding	116	10
Boat fishing	87	8
Relaxing	69	6
Personal watercraft use	56	5
Tent camping	48	4
Houseboating	35	3
Horseback riding	33	3
Picnicking	29	3

Note: Most of the remaining 31 activities were each specified as visitor's primary activity by less than 15 respondents.

County and City of Residence

Two-thirds of respondents indicated they were residents of Butte County, a percentage consistent with the high percentage of visitors who had visited the Lake Oroville Area during several seasons of the past year and who are regular visitors. Survey information on the zip code of visitors' primary residence further indicates that the largest proportion of Butte County residents were residents of Oroville, and so enjoy very close access to Lake Oroville recreation areas. The largest numbers of non-Butte County respondents were residents of Yuba City and Marysville (5% of Total), two adjacent communities roughly 30 minutes south of the City of Oroville by car.

Table 4.6 County of Residence

	Frequency	Percent
Butte County Resident	835	66
Non-Butte County Resident	440	35
Total	**1,275**	**100**

Table 4.7 City of Residence (most frequent responses)		
	Frequency	**Percent**
Butte County Residents		
Oroville	430	34
Chico	137	11
Paradise	83	7
Gridley/Biggs	51	4
Others	134	11
Non-Butte County Residents		
Yuba City/Marysville	56	5
Sacramento	15	1
San Jose	13	1
Reno, NV	11	<1
Others	345	27
Total	**1,275**	**100**

Note: "Others" include more than 200 other cities of residence responses, both within and outside Butte County. All of these were given by 10 or fewer visitors.

4.1.1.2 Perceptions of Crowding at Recreation Areas

Visitors surveyed on-site were asked how crowded they felt at the recreation area they were using. Respondents used a nine-point scale to indicate their perception, with a value of 1 labeled "not at all crowded" and 9 labeled "extremely crowded." The values of 3 and 6 were labeled as "slightly" and "moderately crowded," respectively.

More than two thirds of visitors gave a response of 1, 2, or 3—the low end of the scale. In contrast, about 10% gave responses at the high end of the scale (responses of 7, 8, or 9). Overall, these responses convey a low level of concern about crowding felt by most visitors and at most locations. Subsequent analysis will focus on revealing the locations, types of visitors, and other characteristics related to site crowding responses of 6 or above.

Table 4.8 Perceptions of Crowding at Recreation Areas		
	Frequency	**Percent**
1—Not at all crowded	510	42
2	141	12
3—Slightly crowded	169	14
4	57	5
5	71	6
6—Moderately crowded	145	12
7	45	4
8	25	2
9—Extremely crowded	54	4
Total	**1,217**	**100**
Mean response: 3.1/9.0		

4.1.1.3 Perceptions of Scenic Quality at Recreation Areas

Using a similar scale, visitors were asked to rate the quality of the scenery at the recreation area where they were surveyed. Once again, four values on the scale were labeled: 1 = extremely unappealing, 3 = unappealing, 6 = appealing, 9 = extremely appealing.

The most frequent response, about one-third of the total, was 6 (appealing), and about two-thirds of responses were clustered in the upper-middle range of 5, 6, and 7. Another 16 percent were at the highest end of the scale (value of 9). The mean response was 6.3. In general, these responses reveal that most visitors have a favorable opinion of the scenery around the recreation areas they used, although not necessarily the most favorable assessment possible. Subsequent analysis will focus on investigating further the locations associated with the most unfavorable opinions of the scenery. It is important to point out that opinions of scenery received from boaters (most surveyed at launch ramps at the conclusion of their boat outings or at a campground) are not interpreted to relate to the shoreline scenery they observed while boating. The survey question asks visitors to rate the scenery at "the location you are currently at," i.e., at the boat launch facility or campground.

Table 4.9 Perceptions of Quality of Scenery		
	Frequency	**Percent**
1—Extremely unappealing	22	2
2	9	1
3—Unappealing	43	4
4	62	5
5	172	14
6—Appealing	406	34
7	199	17
8	97	8
9—Extremely appealing	193	16
Total	**1,203**	**100**
Mean response: 6.3/9.0		

4.1.1.4 River and Reservoir Boating Section Questions

Approximately 65% (834 of 1,279) of the visitors surveyed completed some or all of the boating section of the on-site survey booklet. The results reported in this section are based on analysis of responses from those visitors. Visitors who did not expect to boat during their visit were instructed to skip the entire section.

Boaters' Encounters with Other Users on the Water that Put Them at Risk

Boating visitors were asked "Did you personally experience any encounters with other users on the water that put you at risk?" and, if yes, to briefly describe the encounter. About 9% of boaters indicated they did have such an encounter and most provided a description. Most of these descriptions detailed how another pleasure boaters' unsafe or discourteous boating made them feel at risk. Examples include: "A boater came too close to us although our orange flag was out"; "Boater cut us off while they were skiing"; and "Too fast, too close."

Several boaters specifically singled out personal watercraft in their descriptions. Some examples of this type of encounter include: "Jet ski turned toward me and nearly had a head-on collision—she was not paying attention—near miss of about 15 feet"; "Reckless

jet ski cutting too closely in front of us"; and "Personal watercraft drive recklessly, especially when larger boats are pulling skiers." Some comments appear to refer to general unsafe or discourteous boater behavior rather than actual risk-causing encounters that the boater experienced: "Other boaters are rude and don't know how to wait their turn to launch or pull out"; "People who hold their boat on dock and take up space"; and "People get wild without patrol boat around."

Table 4.10 On-water Encounters that Put Surveyed Boaters at Risk

	Frequency	Percent
Yes (had risk-causing encounter)	72	10
No (did not have a risk-causing encounter)	616	90
Total	**688**	**100**

Boaters' Observation of Boating Activity that Put Others at Risk

Boating visitors were asked "Did you observe any boating activity today that you felt put others at risk?" and, if yes, to briefly describe the unsafe activity. Similar to encounters they experienced themselves, about 8% of boaters indicated they did observe such activities and most provided a description. The activities described were often similar to those that boaters described putting themselves at risk, although some may be descriptions of activities seen from a distance. Examples include: "Fast in no-wake zone"; "High speed boating too close to others"; and "Near collision at two different times."

Once again, several boaters specifically singled out personal watercraft in their descriptions. Some examples of this type of observation include: "Jet skis following too close to boats"; "3 kids on jet skis operating erratically"; and "Jet skiers moving at unsafe speed." Several boaters expressed concern about alcohol use on the water: "Careless

boaters, possibly drinking too much alcohol"; "Operating boats too drunk to stand up"; "Drunk boat operators."

Table 4.11 Observances of Boating Activity that Put Others at Risk

	Frequency	Percent
Yes (observed activity)	68	10
No (did not observe activity)	590	90
Total	**658**	**100**

Perceptions of Crowding on the Water While Boating

Using a question similar to that presented to all visitors earlier in the survey (see Table 4.12), boaters were asked how crowded they felt on the water. (Many respondents apparently had not boated that day and so did not answer the question—see note at the bottom of Table 4.12.) As before, respondents used a nine-point scale to indicate their perception with a value of 1 labeled "not at all crowded" and 9 labeled "extremely crowded." The values of 3 and 6 were labeled as "slightly" and "moderately crowded," respectively.

Nearly 70% of respondents gave a response of 1, 2, or 3—the low end of the scale. In contrast, about 9% gave responses at the high end of the scale (responses of 7, 8, or 9). The mean response was slightly higher than 3 on the 9-point scale. Similar to results on crowding at recreation areas, these responses point to a low level of concern about crowding felt by most boaters at the areas where they boated. Subsequent analysis will focus on revealing the locations and other characteristics related to the minority of responses of 6 or higher.

Table 4.12 Boaters' Perceptions of Crowding on the Water		
	Frequency	**Percent**
1—Not at all crowded	248	38
2	94	14
3—Slightly crowded	111	17
4	40	6
5	40	6
6—Moderately crowded	74	11
7	20	3
8	15	2
9—Extremely crowded	21	3
Total	**663**	**100**
Mean Response: 3.1/9.0		

Note: Over 20% of visitors (171 of 834) who completed the boater section did not answer the crowding question, which referred to the survey day only. These visitors may have boated during previous days of a multiple day trip or may have expected to boat at a later time, but had not boated on the day they were surveyed.

Type of Watercraft Used and Ownership of Watercraft

Boaters were asked to indicate the type of watercraft they primarily use when visiting the Lake Oroville Area (see Table 4.13). About two-thirds use a motorized pleasure boat, which includes runabouts, pontoon boats, cabin cruisers, and fishing boats. About 14% indicated they primarily use a personal watercraft, 7% use a houseboat (moored at the marinas), 4% use non-powered boat such as canoes and kayaks, and 2% use a sailboat (most moored at the marinas). About 85% said they own the boat they primarily use in the Lake Oroville Area, while 6% rent a boat and 9% spend time on or borrow a friend's or family member's boat.

Table 4.13 Type of Watercraft Used and Ownership		
	Frequency	**Percent**
Type of Watercraft		
Runabout, fishing boat, pontoon, etc.	452	66
Personal watercraft (jet ski)	93	14
Houseboat	44	7
Canoe, kayak, etc.	28	4
Sailboat	13	2
Other	50	7
Total	**680**	**100**

Table 4.13 Type of Watercraft Used and Ownership		
	Frequency	**Percent**
Ownership of Watercraft		
Own	571	85
Rent	39	6
Other (borrow from friend, etc.)	63	9
Total	**673**	**100**

Use of Boat Launches

More than 80% of boaters (see Table 4.14) had used one of the boat launches in the Lake Oroville Area, which conforms to the similar percentage who own the boat they primarily use (boat owners would be expected to use launches more than boat renters or borrowers). Boaters were asked which of the 15 boat launches on Lake Oroville, Thermalito Forebay and Afterbay, and Diversion Pool, and any launch sites on the Feather River in the Study Area they had used during the last 12 months. Three of the four main launches on Lake Oroville—the Lime Saddle, Spillway, and Bidwell Canyon launches—were each used by 40-45% of the boaters. The Loafer Creek launch ramp was used by about 30% of boaters. The Enterprise, Foreman Creek Car Top, and Stringtown Car Top launches were used by 5-7%, and the remaining Car Top areas by 1-2% of boaters.

In general, the Forebay and Afterbay launches were used by a much smaller proportion of boaters than the main Lake Oroville launches. The Monument Hill launch ramp was used by about 15% of boaters, while the North Forebay (non-powered boats), South Forebay, and Larkin Road launches were used by 8-11% of boaters. About 4% said they had used a Feather River launch and about 2% had used Burma Road to launch at the Diversion Pool.

Table 4.14 Use of Boat Launches in the Oroville Area		
	Frequency	**Percent**
Ever used one of the boat launches?		
Yes	622	83
No	125	17
Total	**747**	**100**
Launch ramps used during last 12 months		
Lime Saddle	243	39
Spillway	249	40
Bidwell Canyon	278	45
Loafer Creek	189	30
Enterprise	44	7
North Forebay	50	8
South Forebay	54	9
Monument Hill (Afterbay)	90	15
Larkin Road (Afterbay)	65	11
Dark Canyon Car-Top	11	2
Nelson Bar Car-Top	10	2
Vinton Gulch Car-Top	4	1
Foreman Creek Car-Top	38	6
Stringtown Car-Top	32	5
Diversion Pool (Burma Road)	11	2
Feather River Launches	25	4

When asked which boat launch they used most frequently, the pattern was similar to the above, with 20-23% indicating they use the Lime Saddle, Spillway, and Bidwell Canyon launches most frequently. About 12% said they use the Loafer Creek launch most frequently. Among the other Lake Oroville launches, none were mentioned by more than 3.5% of boaters. The Monument Hill and Larkin Road launches were mentioned by 5% and 4% of boaters, respectively, while all other Forebay, Afterbay, and Feather River launches were mentioned by 2% or less of boaters.

Wait to Use Boat Launches

The last question related to boat launches asked boaters if they typically have to wait to use the boat launch they use most frequently (see Table 4.15). Those who indicated they did have to wait were asked to state the average number of minutes they generally waited at that ramp.

About 37% said they typically did have to wait to use the boat launch they use most frequently, but the average length of wait is 10 minutes or less for 70% of those respondents. An approximately equal 36-37% of boaters said they typically wait 1-5 minutes and 6-10 minutes. About 27% said they typically wait 15, 20, or more than 20 minutes.

Table 4.15 Wait to Use Boat Launches in the Oroville Area

	Frequency	Percent
Typically have to wait to use launch?		
Yes	218	37
No	370	63
Total	**588**	**100**
Average length of wait		
1-5 minutes	71	37
6-10 minutes	69	36
15 minutes	27	14
20 minutes	17	9
>20 minutes	8	4
Total	**192**	**100**

Satisfaction with Boating Experience

The last question in the boating section of the on-site survey asked boaters if, overall, they were satisfied with their boating experience on the current trip to the Lake Oroville Area. The percentage who said they were satisfied was quite high at about 89% of boaters.

The 11% of boaters who said they were not satisfied were asked to explain why. A wide range of explanations were given, but several main themes can be discerned. The most common type of complaint referred to boating enjoyment being harmed by low water levels: “It’s a sad sight to see the water so low”; “The water is too low and it is hard to launch”; “Lake Oroville is ugly and so low, it is not fun and a pain to launch.” Several complaints were voiced about the launch facilities: “The boat ramp needs to be steeper”;

"Boat launches need lots of work"; "I had to park a mile away from launch area—no close parking." Others expressed concerns about conditions on the water: "Please get more patrol boats on the lake to prevent problems"; "5 mph no-wake zones are too long—it takes 10-15 minutes to reach your destination"; "Too choppy and too many boats."

4.1.1.5 Angler Section Questions

Approximately 80% (1,017 out of 1,279) of visitors who completed the on-site survey completed some or all of the section focused on angling activity. The results reported in this section are based on analysis of responses from those visitors. Visitors who did not expect to fish during their visit were instructed to skip the entire section.

Past Fishing Activity in the Lake Oroville Area

Around 60% of anglers indicated they had fished in the Lake Oroville Area before their current visit, but the data suggest that most do not fish in the area frequently (see Table 4.16). Among those repeat visitors, over 40% reported from 1 to 5 days of fishing activity in the area during the previous 12 months; another 18% had not fished in the area in the last year. Although several anglers reported 100 or more days of fishing in the Lake Oroville Area, only about one-quarter reported more than 10 days of fishing in the area during that period. Overall, these responses suggest that most anglers using the Lake Oroville Area could be described as "casual" or occasional anglers, but that there also exists a group of frequent/"serious" anglers.

Table 4.16 Past Fishing Activity and Frequency of Fishing in the Lake Oroville Area during the Previous 12 Months

	Frequency	Percent
Fished in Lake Oroville Area before?		
Yes	603	60
No	396	40
Total	999	100
Number of time fished in last 12 months		
0 days	110	18
1-5 days	258	43
6-10 days	82	14
11-20 days	75	12
>20 days	78	13
Total	603	100
Mean: 12.9 visits		

Use of Fishing Guides and Participation in Fishing Tournaments in the Lake Oroville Area

Only 6% of anglers indicated that they had used an outfitter or guide in the Lake Oroville Area during the previous 12 months (see Table 4.17). Similarly, just 4% had participated in fishing tournaments during the previous 12 months (see Table 4.18). Several different tournaments were named by participants, with some participating in three or more such events.

Table 4.17 Use of Fishing Outfitter/Guides in the Lake Oroville Area during the Previous 12 Months

	Frequency	Percent
Yes, have used outfitter/guide	65	6
No, have not used outfitter/guide	952	94
Total	**1,017**	**100**

Table 4.18 Participation in Fishing Tournaments in the Lake Oroville Area during the Previous 12 Months

	Frequency	Percent
Yes, have participated in tournaments	44	4
No, have not participated	973	96
Total	**1,016**	**100**

Perceptions of Crowding at Fishing Areas

Using a question similar to that presented to all visitors earlier in the survey (see Table 4.12), anglers were asked how crowded they felt at the recreation area they fished at that day. (Many respondents apparently had not fished that day and so did not answer the question—see note at the bottom of Table 4.19.) As before, respondents used a nine-point scale to indicate their perception with a value of 1 labeled "not at all crowded" and 9 labeled "extremely crowded." The values of 3 and 6 were labeled as "slightly" and "moderately crowded," respectively.

Nearly 70% of respondents gave a response of 1, 2, or 3—the low end of the scale. In contrast, about 11% gave responses at the high end of the scale (responses of 7, 8, or 9). The mean response was slightly higher than 3 on the 9-point scale. Similar to results on crowding at recreation areas, these responses point to a low level of concern about crowding felt by most anglers at the areas where they fished. Subsequent analysis will focus on revealing the locations and other characteristics related to the minority of responses of 6 or higher.

Table 4.19 Perceptions of Crowding at Fishing Areas

	Frequency	Percent
1—Not at all crowded	187	41
2	56	12
3—Slightly crowded	68	15
4	23	5
5	29	6
6—Moderately crowded	39	9
7	15	3
8	4	1
9—Extremely crowded	32	7
Total	**453**	**100**
Mean response: 3.1/9.0		

Note: More than 50% of visitors (564 of 1,017) who completed the angler section did not answer the crowding question, which was asked in reference to the day of the survey. However, these visitors may have fished during previous days of a multiple day trip or may have expected to fish at a later time, but had not fished on the day they were surveyed.

Fish Species Sought, Fish Caught, and Fish Released

Within the survey booklet anglers were presented a table in which they were to indicate the species that they had fished for among 11 listed species (along with “other” and “no preference”). They were to further indicate the number of fish caught within each species by 5 size categories and the number of caught fish released. Finally, anglers seeking trout, salmon, and steelhead were to indicate, if possible, whether any fish of those species they had caught had their adipose fin clipped (indicating whether the fish was a hatchery-raised or wild fish).

It seems apparent that most anglers were unable to complete or unwilling to attempt completing the table, as more than 80% did not provide any information for the fish species they sought and even fewer provided information on fish caught or released. Among the 19% who did provide some data, the species that the largest proportion of anglers indicated they were fishing for were black bass, salmon, and trout. However, no more than 9% indicated they were fishing for any of the listed species, a much lower percentage than would be expected to report pursuing the most popular species. Further analyses will be necessary to fully determine the effect of low response on data quality relative to this creel information.

Time Anglers Began and Finished Fishing and Total Fishing Hours

Table 4.20 shows that about one-third of anglers provided the time they began and finished fishing (most of those who did not respond to the question are presumed to have not fished on the day they were surveyed). The results indicate that the greatest proportion of anglers starting fishing early in the day, before 8:00 am. Most others started before noon. About one third finished fishing before noon, but most finished

during the afternoon, primarily from 3:00 to 6:00 pm (31%). About one-fourth didn't stop fishing till the early evening, after 6:00 pm.

Subsequent analysis will focus on computing the number of hours anglers spend fishing (i.e., fishing effort) based on these start and end times.

Table 4.20 Time Anglers Began and Stopped Fishing

Time Period	Start Time (%)	Finish Time (%)
Before 8:00 am	41	13
8:00 am to 12:00 noon	31	20
12:00 noon to 6:00 pm	26	44
After 6:00 pm	2	23
Total	**100**	**100**

Opinions of Fishing Regulations

Anglers were asked whether they felt knowledgeable about fishing regulations and whether they allow a quality recreation experience (see Table 4.21). About one-half of anglers did not answer these questions, but among those who did provide responses, nearly all indicated that they did feel knowledgeable about the regulations and that they do allow a quality recreation experience. Only 9% did not feel knowledgeable and 5% felt the regulations did not allow a quality recreation experience.

Table 4.21 Opinions of Fishing Regulations

	Do you feel knowledgeable about fishing regulations? (%)	Do they allow a quality experience? (%)
Yes	83	90
No	17	10
Total	**100**	**100**

Satisfaction with Fishing Experience at the Lake Oroville Area

The last question within this section asks anglers if they were satisfied with their fishing experience at the Lake Oroville Area during their current visit (see Table 4.22). Those who were not satisfied were asked to explain why.

As was the case with several questions in this section, a high percentage of anglers did not provide a response. Among those that provided a response, a majority (75%) recorded that they were satisfied with their fishing experience.

Although anglers who were not satisfied expressed their reasons for dissatisfaction using many different statements, the great majority of negative commenters complained about not catching fish. Some typical comments of this type include: “Catching few fish”; “Didn’t catch any”; and “Didn’t get any bites.” Most others pointed to water level issues (e.g., “Not enough water”; “The lake is too low”).

Complaints about poor fishing success are not unexpected, given that catching fish is important to the recreation goals and satisfaction of most anglers. However, we cannot assume that lack of fishing success is the result of bad fishing conditions rather than lack of skill, poor choice of fishing location, or just bad luck. Several anglers elsewhere in the survey expressed the opinion that Lake Oroville provides consistently good fishing opportunities.

Table 4.22 Satisfaction with Fishing Experience in the Lake Oroville Area

	Frequency	Percent
Yes (Satisfied with experience)	332	75
No (Not satisfied with experience)	109	25
Total	**441**	**100**

4.1.1.6 Trail User Section Questions

Approximately 56% of visitors (715 of 1,279) completed some or all of the section of the on-site survey focused on trail use. The results reported in this section are based on analysis of responses from those visitors. Visitors who did not expect to use a trail during their visit were instructed to skip the entire section.

Primary Type of Trail Use

More than 70% of trail users who gave a response indicated their primary type of trail use was hiking or walking (see Table 4.23). Bike riding was the primary use for 15% and equestrian use for 10%. A few respondents pointed to more than one primary use (e.g., bike and hike) or referred to use of undesignated trails to get to fishing areas, both of which were categorized as "other."

Table 4.23 Primary Type of Trail Use

	Frequency	Percent
Hiking/walking	347	71
Biking	75	15
Equestrian	50	10
Other	17	4
Total	**489**	**100**

Repeat vs. First Time Trail Use

Only about 20% of trail users indicated that their current visit was their first time using the non-motorized trails in the area.

Perception of Crowding on Trails

Using a question similar to that presented to anglers (see Table 4.19), trail users were asked how crowded they felt on the trails they used that day. (Many respondents apparently had not used the trails that day and so did not answer the question—see the note at the bottom of Table 4.24.) As before, respondents used a nine-point scale to

indicate their perception with a value of 1 labeled “not at all crowded” and 9 labeled “extremely crowded.” The values of 3 and 6 were labeled as “slightly” and “moderately crowded,” respectively.

Nearly 90% of respondents gave a response of 1, 2, or 3—the low end of the scale—while only 2.5% gave responses at the high end of the scale (responses of 7, 8, or 9). The mean response was about 2 on the 9-point scale. Similar to what visitors expressed about crowding at recreation sites and fishing areas, these responses point to a low level of concern about crowding felt by most trail users. Subsequent analysis will focus on revealing the locations and other characteristics related to the minority of responses of 6 or higher.

Table 4.24 Perceptions of Crowding on Trails

	Frequency	Percent
1—Not at all crowded	293	61
2	66	14
3—Slightly crowded	60	13
4	18	4
5	15	3
6—Moderately crowded	13	3
7	3	1
8	0	0
9—Extremely crowded	9	2
Total	**477**	**100**
Mean Response: 2.0/9.0		

Note: About one-third of visitors (238 of 715) who completed the trail use section did not answer the crowding question, which referred to the survey day. These visitors may have used trails during previous days of a multiple day trip or may have expected to use them at a later time, but had not used the trails on the day they were surveyed.

Trail Users’ Encounters with Other Users on the Trails that Put Them at Risk

Less than 6% of trail users indicated that they had experienced an encounter or encounters with other trial users during their current visit that put them at risk (see Table 4.25). Those who had had an encounter were asked to describe them. However, many of the encounters were left unspecified or not described in enough detail to characterize

them (e.g., “Crazy people”; “Two other parties”). Others encounters described were not with other trail users but with wildlife (snakes, skunks, deer).

About 20 trail users described encounters with runners with dogs, discourteous bike riders, motorized trail users/cars, or people who did not appear to be trail users. Those who had encounters that they felt had put them at risk were also asked to indicate the types of other users with whom they had these encounters. About equal numbers of trail users indicated encounters with hikers/walkers, bikers, and equestrians (from 6 to 9 of the 39 who said they had some type of risk-causing encounter). Others types of people encountered included motor vehicles users, anglers, Frisbee golfers (at Riverbend Park), “homeless people,” and “drinking picnickers.”

Table 4.25 Trail Encounters that Put Trail Users at Risk

	Frequency	Percent
Had encounter that put you at risk?		
Yes	39	6
No	676	94
Total	**715**	**100**
If Yes: With whom have you had encounters?		
Hikers/walkers	9	23
Bikers	8	21
Equestrians	6	15
Other (e.g., ATV rider, disc golfer, fishermen)	11	28

Satisfaction with Condition of Trails

Trail users were asked if they were satisfied with the condition of the Lake Oroville Area trails they used during their current trip and, if not, why not (see Table 4.26). About 10% of trail users responded that they were not satisfied. However, few of those who were not satisfied expressed concerns about the condition of the existing trails. Instead, most expressed complaints about such items as a lack of good foot access to the Lake Oroville shoreline, or expressed desires for more trails or trail side amenities.

The comments about trail condition also give the impression that visitors thought of trails more broadly than the designated and maintained 40-mile multiple-use trail system. (This system includes several loops in the Loafer Creek area, continues to the Bidwell Canyon and Kelly Ridge areas and to areas along the Feather River below Lake Oroville, and through the Oroville Wildlife Area.) Many comments related to the short paved loop trail at the North Forebay recreation area, and other areas where there are no designated trails but where there is foot access to Lake Oroville and the Feather River.

Six trail users had complaints about animal waste and litter on trails, and four cited problems with physical trail conditions (e.g., trails become too dusty due to grading, trails not wide enough, rocks falling). Most other concerns about trail conditions were related to lack of good trail access to the shoreline of Lake Oroville, especially as the lake level drops, and desire for more trails and trail side amenities such as water troughs for horses and potable water. A few complaints were made about poison oak, snakes, and lack of trail signage.

Table 4.26 Satisfaction with Condition of Trails

	Frequency	Percent
Are you satisfied with the condition of trails?		
Yes	426	90
No	45	10
Total	**471**	**100**
If No: Why not?		
Poor access to shore/water; shore access too steep	10	22
Need more trails, better access	7	16
Need better clean-up, trash removal	6	13
Complaints about trail surface (rocks, dust, width)	4	9
Need more amenities (water, restrooms)	4	9
Nuisance plants and animals	3	7
Need better signage	2	4
Other complaints/unspecified	9	20
Total	**45**	**100**

Favorite Trail Section

Trail users were asked to name their favorite trail or trail section in the Lake Oroville Area (see Table 4.27). A wide range of responses were given, with about 23% able to specify one or two trails or sections (others said "all trails" or "no preference"). Most who had a favorite trail referred to an area rather than a named trail, although some specifically mentioned trails such as the Dan Beebe Trail (the 41 mile trail extending from the dam along both sides of the Diversion Pool and around the Thermalito Forebay and Afterbay). By area, trails in the Loafer Creek area were mentioned as favorites most often, closely followed by trails on the east side of the Diversion Pool and the Feather River north of Oro-Dam Boulevard. Several mentioned two popular trails, the Feather Falls and Bald Rock trails, both of which are outside the Study Area.

Table 4.27 Favorite Trail Sections

	Frequency	Percent
Listed a favorite trail		
Yes	166	23
No	547	77
Total	**715**	**100**
Favorite trails/trail sections by area or name		
Trails along Diversion Pool/Feather River	39	22
Trails in Loafer Creek area	35	20
Trails in Bidwell Canyon and Kelly Ridge areas	23	13
Feather Falls and Bald Rock Trails	23	13
Forebay area	15	8
Dan Beebe Trail (Lakeland Blvd. to Kelly Ridge)	11	6
Brad Freeman Trail (Oroville Dam and around OWA)	8	5
Afterbay area	7	4
Oroville Wildlife Area	5	3
Bike Trail (unspecified)	5	3
Oroville Dam	4	2
Brooks Orchard	3	2
Total	**178**	**100**

Note: The total number of favorite trails is greater than the number who listed a favorite trail because some respondents gave more than one response.

4.1.1.7 New Recreation Activities Desired

Respondents to the mail survey were asked if there were any recreation activities or special events not offered in the Lake Oroville Area that they would like to do.

Approximately 11% of respondents listed at least one such activity or event; a few visitors listed as many as 5 or 6 activities (see Table 4.28). A total of 52 different activities and events were mentioned, with most mentioned by only one person. Responses that referred to facilities that would allow a new recreation activity were accepted as valid, while those that simply listed desired improvements to or expansion of existing facilities were not.

Five activities and events were mentioned by 5 or more people: beach or swim areas; paddleboat, canoe, or kayak rentals; parasailing; athletic competitions such as bike and running races and triathlons; and shoreline camping. Requests for a beach or swim area were most frequent by a wide margin.

A swimming beach exists and is available year-round at the North Forebay Recreation Area. However, because this type of facility is not available for much of the main summer use season on Lake Oroville (the swim area at the Loafer Creek Day Use Area was not usable for much of the summer of 2002 due to a low water levels), and many visitors' use is focused solely on the lake, it was treated as a valid response. Similarly, shoreline camping is available at several boat-in camping areas on Lake Oroville, but the shoreline is increasingly distant as the lake level drops. The much more heavily used drive-in campgrounds at the Lime Saddle, Loafer Creek, and Bidwell Canyon Recreation Areas do not offer shoreline campsites. Finally, while canoeing and kayaking are available activities on the Oroville Area reservoirs and the Feather River, and rentals are available in the general area, rentals are not available on-site (for example, at water-side day use areas or boat launch areas), as some apparently desire.

Table 4.28 New Activities and Events Desired for Lake Oroville Area		
	Frequency	**Percent**
Listed a new activity		
Yes	95	11
No	763	89
Total	**858**	**100**
New activities listed (top 5):		
Beach/swim area	26	27
Paddleboat/canoe/kayak rental	7	7
Parasailing	6	6
Athletic competitions (e.g., races, triathlons)	6	6
Shoreline camping	5	5

Note: 47 additional activities and events were mentioned, 27 by one person and 20 by 2 to 4 people. Percentages mentioning each activity/event listed above are based on the 95 respondents who gave at least one valid response.

4.1.1.8 Use of Other Regional Recreation Areas

Mail survey respondents were asked to indicate what other recreation places in northern California other than the Lake Oroville Area they have visited in the past 12 months (see Table 4.29). They were presented with a list of 30 places (and could add others) that included other reservoirs and rivers as well as Lake Tahoe and the San Francisco Bay/Delta Area. Visitors were also asked to indicate which, if any, of those places they had visited on their recent trip to the Lake Oroville Area.

For 17 of the 30 northern California recreation places listed, at least 10% of the respondents had visited the areas. The most-visited was the San Francisco Bay/Delta Area, with 37% having visited that area in the last year. The Sacramento River and Lake Tahoe were both visited by 34% of Oroville Area visitors. Most of the other more commonly visited places were various tributaries of the Feather River or other large reservoirs such as Lake Shasta and Folsom Lake.

The survey data suggests that the Lake Oroville Area is the sole destination for most visitor trips, as about 82% of the visitors had not visited any other northern California

recreation areas during their trip to the Lake Oroville Area. Among the 18% who had visited other places during their trip, most referred to visiting the Middle, South, and North Forks of the Feather River.

Table 4.29 Other Northern California Recreation Places Visited During the Past 12 Months

	Frequency	Percent
San Francisco Bay/Delta Area	316	37
Sacramento River	294	34
Lake Tahoe	294	34
Lake Almanor	208	24
North Fork Feather River	195	23
Middle Fork Feather River	178	21
South Fork Feather River	162	19
Lake Shasta	157	18
Lower Feather River	149	17
Folsom Lake	136	16
Plumas National Forest rivers & lakes	115	13
Yuba River	108	13
Lassen Volcanic National Park	102	12
Lake Berryessa	99	12
Little Grass Valley Reservoir	92	11
Lassen National Forest rivers & lakes	88	10

Note: The 14 other places listed on the survey were each visited by less than 10% of respondents.

4.1.1.9 Preferences for Recreation Setting and Opportunities

Respondents to the mail survey answered a suite of five questions related to their preferences for the type of recreation opportunities and level of development at the Lake Oroville Area. Visitors responded to these questions using 4, 5 or 7-point scales. As a group, responses to these questions characterize the type of recreation settings and opportunities that visitors are most interested in having available in the Lake Oroville Area. Recreation areas may provide a range of possible settings and opportunities from the most primitive and lightly used to the most developed and heavily used.

Preference for Opportunity to Experience Solitude

Visitors were asked for their preference for solitude using a seven-point scale, with one end of the scale (1) meaning "solitude is extremely important" and the opposite end (7) meaning "affiliation with other groups is extremely important" (see Table 4.30). Thus, lower values indicate a higher preference for solitude while recreating, and higher values indicate a higher preference for recreation with other groups nearby.

Overall, most visitors' preferences appear to fall between the extremes, with solitude somewhat more preferred than affiliation with others. The most frequent response was 4 ("solitude and affiliation are equally important") and the mean response was about 3.5 (between "solitude is important" and "solitude and affiliation are equally important").

Table 4.30 Preferences for Solitude

	Frequency	Percent
1—Solitude is extremely important	85	10
2—Solitude is very important	110	14
3—Solitude is important	189	23
4—Solitude and affiliation are equally important	309	38
5—Affiliation with other groups is important	28	3
6—Affiliation with other groups is very important	19	2
7—Affiliation with other groups is extremely important	75	9
Total	**815**	**100**
Mean Response: 3.5/7.0		

Preference for Opportunity to Experience Risk and Challenge from the Natural Environment

Visitors were asked for their preference for risk and challenge using a five-point scale, with one end of the scale (1) meaning "not important" and the opposite end (5) meaning "extremely important" (see Table 4.31) Thus, lower values indicate a lower preference for risk and challenge while recreating, and higher values indicate a higher preference for risk and challenge while recreating.

The most frequent response was 1 (risk and challenge is not important) and the mean response was 2.5. Overall, visitors' responses convey that risk and challenge is not important for nearly one-third of visitors but moderately important for about half of the visitors. Risk and challenge is very or extremely important to only about one-fifth of visitors.

Table 4.31 Preferences for Risk and Challenge

	Frequency	Percent
1—Risk and challenge is not important	241	29
2—Risk and challenge is somewhat important	185	22
3—Risk and challenge is important	229	28
4—Risk and challenge is very important	103	12
5—Risk and challenge is extremely important	72	9
Total	**830**	**100**
Mean Response: 2.5/5.0		

Preference for Opportunity to Use Wilderness Skills

As with preferences for risk and challenge, visitors were asked for their preference for opportunities to use wilderness skills, using a five-point scale, with one end of the scale (1) meaning "not important" and the opposite end (5) meaning "extremely important" (see Table 4.32) Thus, lower values indicate a lower preference for using wilderness skills while recreating, and higher values indicate a higher preference for using wilderness skills while recreating.

Similar to visitors' preferences for risk and challenge, the responses convey that using wilderness skills is moderately important for about half of the visitors. In comparison, using wilderness skills is very or extremely important to only about 28% of visitors and it is not important for about one-fifth of visitors. The most frequent response was 3 (using wilderness skills is important) and the mean response was 2.7.

Table 4.32 Preferences for Using Wilderness Skills		
	Frequency	**Percent**
1—Using wilderness skills is not important	176	21
2—Using wilderness skills is somewhat important	189	23
3—Using wilderness skills is important	239	29
4—Using wilderness skills is very important	131	16
5—Using wilderness skills is extremely important	97	12
Total	**832**	**100**
Mean Response: 2.7/5.0		

Preference for Exposure to the Sights and Sounds of Civilization

As above, visitors were asked to express their preference for the presence of the sights and sounds of civilization using a five-point scale, with one end of the scale (1) meaning "absent" and the opposite end (5) meaning "dominant" (see Table 4.33). Thus, lower values indicate a lower preference for the presence of the sights and sounds of civilization while recreating, and higher values indicate a higher preference for the presence of the sights and sounds of civilization while recreating.

The most common response, given by over 40% of visitors, is that the sights and sounds of civilization should be rare, and about 54% combined prefer these sights and sounds to be rare or absent. Slightly less than one-third of visitors preferred these sights and sounds to be unusual, while 18% prefer them to be common or even dominant. The mean response was 2.5, which corresponds to a preference between "rare" and "unusual."

Table 4.33 Preferences for Exposure to the Sights and Sounds of Civilization		
	Frequency	**Percent**
1—Sights and sounds should be absent	108	13
2—Sights and sounds should be rare	335	41
3—Sights and sounds should be unusual	235	29
4—Sights and sounds should be common	142	17
5—Sights and sounds should be dominant	6	1
Total	826	100
Mean Response: 2.5/5.0		

Preference for Appearance of the Landscape

Finally, visitors were asked to express their preference for the level of development apparent in the surrounding landscape while they recreate, using a 4-point scale (see Table 4.34). A value of 1 on the scale corresponds to a preference for a landscape "totally natural in appearance," while a value of 4 corresponds to a preference for a "significantly modified landscape." Here, lower values indicate a higher preference for a natural landscape, and higher values indicate a higher preference for modified landscape. More than one-half of visitors indicated a preference for a predominantly natural landscape while recreating, with another one-quarter preferring a landscape modified on a small scale. About one-sixth of respondents prefer a totally natural landscape, while only 3% preferred the opposite (a significantly modified landscape).

Table 4.34 Preferences for Degree of Development of the Landscape

	Frequency	Percent
1—Landscape should be totally natural in appearance	143	17
2—Landscape should be predominantly natural	454	54
3—Landscape should be modified on a small scale	213	26
4—Landscape should be significantly modified	24	3
Total	834	100
Mean Response: 2.1/4.0		

4.1.1.10 Problems Encountered During Visit

Visitors who received the mail survey booklet were presented with a list of 25 problems or issues they might consider to have been problems during their recent trip to the Lake Oroville Area (see Table 4.35). Nine of these related to various aspects of recreation area management (maintenance, fees, services, or access), five related to water conditions, and 11 related to behavior of or interaction with other area users. Respondents were asked to check one of four boxes to indicate for each item whether they thought it was "not a problem," "a slight problem," "a moderate problem," or "a big

problem." If they were uncertain about an item or felt it did not apply to their recreational use of the area, they were instructed to check the box labeled "N/A."

In general, few visitors considered the issues presented to be big problems during their visit. The proportion of visitors who considered issues to be "a big problem" ranged from 1% to 29%, but for 15 of the 25 issues the proportion was 5% or less. Within the management group of nine issues, three issues related to the shoreline were found to be the subject of relatively elevated level of concern, with 8 to 14% of visitors considering them to be big problems: litter along the shoreline, sanitation along the shoreline, and access to the shoreline. Within the water conditions group, the issue of floating debris in the water was considered a big problem by about 10% of visitors. More conspicuous is the 24 to 29% who considered three issues associated with water levels—exposed land and shallow areas during low water levels and water level fluctuation—to be "a big problem." Within the user interactions group, just two of the 11 issues were found to be subject to a slightly elevated level of concern: encounters between PWC users and others (9%) and unsafe behavior by others (7%).

Table 4.35 Perceptions of Management, Water Conditions, and User Interactions (visitors who consider issues to be "a big problem")

	Frequency	Percent
Management		
Litter along the shoreline	80	10
Sanitation along the shoreline	57	8
Cost to use facilities	11	2
Overall safety and security	25	3
Availability of service/staffing	25	4
Adequate information/warnings provided	25	3
Adequacy of landscaping of facilities	30	4
Access to the shoreline	108	14
Law enforcement presence	41	6
Water Conditions		
Exposed land during low water levels	211	29
Shallow areas during low water levels	175	24
Floating debris in the water	75	10
Quality of water	32	4
Water level fluctuation	192	27

Table 4.35 Perceptions of Management, Water Conditions, and User Interactions (visitors who consider issues to be "a big problem")

	Frequency	Percent
User Interactions		
Numbers of watercraft	28	4
Noise from boats and personal watercraft	37	5
Boat speed or wake effects	32	5
Encounters between water skiers and others	17	3
Encounters between pleasure boaters & boat anglers	19	3
Encounters between PWCs and other users	60	9
Unsafe behavior by other users	51	7
Numbers of people at developed facilities	31	4
Use of alcohol by other users	33	5
Encounters between visitors and residents	7	1
Encounters between trail users and other users	4	1

Note: "N/A" responses were not included within the total number of responses when calculating percentages responding "a big problem" to each issue. For most of the 25 issues, 10 to 20% of respondents checked the "N/A" box or did not respond. Around one-quarter did so for five issues, and 37% did so for one issue. Thus, the percentages who considered issues to be "a big problem" would be slightly lower for some issue if the "N/A" responses were included.

4.1.1.11 Perceptions of Adequacy of the Number or Amount of Facilities and Services

Using a format similar to that discussed above used to measure visitors' perceptions of management and other issues, respondents to the mail survey were asked to evaluate 27 different facilities and services related to five activity categories (see Table 4.36). The categories contain items specific to trail use, camping, boating, fishing and hunting, and other activities. They were instructed to check one of three boxes to evaluate each facility or service as "too few," "about right," or "too many" in number or amount. As previously, respondents were instructed to check a box labeled "N/A" if they were unsure or felt it did not apply to their visit to the Lake Oroville Area.

Because most visitors did not participate in all the types of activities covered by the 27 items, for 22 of the items a majority did not express an opinion. For 16 of the items less than one-third had an opinion. For this reason, the focus of this discussion is on the five items for which most visitors did express an opinion—i.e., these are the items that the greatest number of visitors cared about. Fifty-six percent expressed an opinion on the

number of docks or temporary moorage, 60% on the number of developed day use or picnic areas along the shore, 63% on the number of swim areas, 69% on the number of boat ramps, and 83% on the number of restrooms.

Three of these five were also the items for which the greatest percentage of visitors evaluated the number of facilities as "too few." For most items, between 20 and 40% indicated the number of facilities was too low, but for these three items, 50% or more of the respondents felt that way. One of the items relates to boating: 51% felt the number of docks or temporary moorage facilities was too few. The other two types of facilities are of wider interest to visitors: 50% cited the number of swim areas as too low and 57% felt the number of developed day use or picnic areas along the shore was too few.

Table 4.36 Perceptions of Adequacy of the Number or Amount of Facilities and Services (visitors who consider facility/service to be "too few" in number or amount)

	Too Few (%)	About Right (%)	Too Many (%)
Number of boat ramps	36	64	1
Number of docks or temporary moorage	51	49	1
Amount of swim areas	50	50	<1
Number of restrooms	39	60	1
Number of developed day use or picnic areas along the shore	57	42	1

Note: Calculations of percentages responding "too few" do not include "N/A" responses within the total number of responses. "N/A" responses for the five items above ranged from 17 to 44%. "N/A" responses for the remaining 22 items ranged from 51 to 81%.

It is recognized that items for which most visitors did not express an opinion are still important to the minority that did. For example the 21% who expressed an opinion about equestrian trails, the 30% who expressed an opinion about hiking trails, and the 32% who expressed an opinion about boat-in campsites may well depend on those facilities for their enjoyment of the Lake Oroville Area. Therefore, subsequent analysis will focus more broadly on the full set of facilities and services evaluated in the survey.

4.1.1.12 Overall Satisfaction with Recreation Experience

The last recreation specific question in the mail survey booklet asked visitors how satisfied they were, overall, with their recreation experience on their recent trip to the Lake Oroville Area (see Table 4.37). Visitors chose one response from a 9-point scale, ranging from "extremely dissatisfied" at one end to "extremely satisfied" at the opposite end. For the purposes of data coding and calculating a mean response, responses were assigned values from 1 ("extremely dissatisfied") to 9 ("extremely satisfied"). Therefore, higher values indicate a higher level of overall satisfaction.

A strong majority of visitors were positive in their overall evaluation of their visit, although relatively few were "extremely satisfied." Responses of "satisfied" and "very satisfied" were most frequent, by a wide margin with similar percentages (31% and 29% respectively). Together, these two responses accounted for 60% of responses. If the most positive evaluation of "extremely satisfied" is added to those two, about 70% of responses are included. In contrast, at the other end of the scale, about 12% indicated they were "dissatisfied" to "extremely dissatisfied." The "middle" responses, between "somewhat satisfied" and "somewhat dissatisfied," accounted for the remaining 18% of responses. The mean response was approximately 6.6 out of a possible 9, which falls between "somewhat satisfied" and "satisfied."

Table 4.37 Overall Satisfaction with Recreation Experience on Recent Trip to Lake Oroville Area		
	Frequency	**Percent**
1—Extremely dissatisfied	25	3
2—Very dissatisfied	50	6
3—Dissatisfied	26	3
4—Somewhat dissatisfied	44	5
5—Neither dissatisfied or satisfied	34	4
6—Somewhat satisfied	74	9
7—Satisfied	262	31
8—Very satisfied	246	29
9—Extremely satisfied	76	9
Total	**837**	**100**
Mean response: 6.6/9.0		

4.1.1.13 Demographic Profile

Table 4.38 shows the education level of respondents to the Oroville on-site survey. Nearly all (94%) respondents had at least graduated high school. More than 60% of respondents had attended some college education or attained a Bachelor's degree.

Table 4.38 Education Level	
Education Level	**Percentage**
Some High School	6
High School graduate	23
Some College	42
Bachelor's Degree	20
Master's Degree	7
Ph.D. or M.D.	2
Total Respondents = 1158	

Table 4.39 shows the primary occupation of respondents to the Oroville on-site survey. About one-third of the respondents listed their primary occupation as either professional/technical or manager/administrator. Less than one in ten (9%) listed their occupation as a skilled laborer and 6% listed their occupation as either a teacher/professor or a student.

Table 4.39 Primary Occupation	
Occupation	**Percentage***
Professional/Technical	21
Manager/Administrator	12
Sales	5
Clerical	3
Service	3
Teacher/Professor	6
Skilled Worker	9
Laborer	4
Retired	9
Student	6
Military	<1
Homemaker	7
Other Occupations	16
Total Respondents = 1159	

** percentages do not sum to 100 percent due to rounding*

Table 4.40 shows respondents' annual household income. The majority of the respondents' households (61%) make less than $60,000 per year. (To place this data in context, in the year 2000 median US household income was about $42,000, median California household income was about $47,000, and median Butte County household income was about $32,000.)

Table 4.40 Household Income	
Income	**Percentage**
Less than $20,000 per year	15
$20,000 to $39,999 per year	22
$40,000 to $59,999 per year	24
$60,000 to $79,999 per year	16
$80,000 to $100,000 per year	11
More than $100,000 per year	12
Total Respondents = 1090	

Table 4.41 shows that ethnicity of the respondents was overwhelmingly White/Anglo (81%). The second-largest category was Latino/Hispanic, representing 8% of the total, with American India/Alaska natives comprising the third-largest category at 4%.

Table 4.41 Ethnicity

Ethnicity	Percentage*
Latino/Hispanic	8
White/Anglo (non-Hispanic)	81
Asian	3
African-American/Black	1
American Indian/Alaska Native	4
Pacific Islander/native Hawaiian	1
Other	3
Total Respondents = 1,139	

** percentages do not sum to 100 percent due to rounding*

Table 4.42 reveals that roughly one half of the respondents are between 35-54 years of age. Twenty-four percent are 25-34, with equal-sized groups of roughly 13% below 25 and above 54 years of age.

Table 4.42 Age

Age Range	Percentage
<18	2
18-24	11
25-34	24
35-44	32
45-54	18
55-64	9
65+	4
Total Respondents =1,152	

4.1.2 Surveys of Visitors to Similar Recreation Sites in Northern California

Visitor surveys were conducted at three other northern California reservoirs besides Lake Oroville—at Shasta Lake 100 miles to the north, at Black Butte Lake 50 miles to the west, and at Lake Berryessa, 75 miles to the southeast. A total of 293 visitors were surveyed; 104 at Shasta Lake, 77 at Black Butte Lake, and 112 at Lake Berryessa. Most of the surveys were conducted on one summer weekend at each lake. Similar groups as those contacted at Lake Oroville were targeted as they were available: boaters, anglers, campers, and users of day use picnic and swim areas.

There were three goals to the “similar site” surveys. The first was to learn about visitors’ perceptions of these other reservoir recreation areas, focusing on some of the same factors as the Lake Oroville Area recreation visitor survey. This allows comparison with Lake Oroville visitors’ perceptions of the Lake Oroville Area and provides additional context to the Lake Oroville survey data. For example, perceptions of crowding and adequacy of facilities were measured at Lake Oroville and at the similar sites.

The second goal was to learn from those visitors who had previously been to the Lake Oroville Area what their perceptions were of the area. The third goal was to learn why visitors who had not been to the Lake Oroville Area had not visited, and whether certain special events or facilities might motivate them to visit.

Within this section of the Interim Report, the responses of visitors to all three similar sites are reported as comprising one sample and then compared with results from the Lake Oroville Area visitor survey. Subsequent analysis and reporting will divide the similar site responses by site.

4.1.2.1 Descriptive Data on Visitors to the Similar Recreation Sites

In order to compare the types of visitors contacted at the similar sites with those contacted at Lake Oroville and to differentiate survey participants, visitors were asked several questions about their group and their visit to the reservoir. Two questions of this type ask visitors about their frequency of their visits to the lake and their primary activity during their current visit to the lake. The questions were asked in an identical form at Lake Oroville and at the similar sites.

Visit Frequency

Visitors to the similar sites were asked to categorize themselves as regular, occasional, infrequent, or first-time visitors, based on the number of visits they make to the area each year (see Table 4.43). Nearly one-half of the visitors categorized themselves as "regular" visitors, defined in the survey booklet as someone who visited 3 or more times per year. About one-quarter were "occasional" visitors and nearly as many were making their first visit to the area.

These results are considerably different than for the Lake Oroville Area, with a much lower proportion of regular visitors (46 vs. 70%) and a higher proportion of occasional visitors (25 vs. 15%). Also, first-time visitors were about twice as frequent in the similar-site sample (22 vs. 11%). The higher proportion of regular visitors to Lake Oroville is likely to relate to the high percentage of visitors who are residents of the adjacent city of Oroville or other parts of Butte County. In contrast, none of the three similar site lakes are directly adjacent to a community. Shasta Lake in particular might be expected to host more first time, infrequent, and occasional visitors. It is a large reservoir located on the I-5 corridor and with numerous recreation development supporting RV campers, boaters, and others on vacation trips some distance from home.

Table 4.43 Frequency of Visits to the Lake Oroville Area and Similar Sites

	Lake Oroville Area (%)	Similar Sites (%)
Regular visitor (3+ visits/year)	70	46
Occasional visitor (1-2 visits per year)	15	25
Infrequent visitor (<1 visit/year)	3	7
First time visitor	11	22
Total	**100**	**100**

Primary Activity during Current Trip to Lake

As at Lake Oroville, visitors were asked to indicate which among a list of 42 activities was their primary activity during their current visit (see Table 4.44). Overall, the dominant primary activities were similar to those of Lake Oroville visitors. Three of the top four activities—swimming, motorboating, and waterskiing/wakeboarding—were also among the top four activities among the sample of Lake Oroville visitors. Differences include the greater prominence of waterskiing/wakeboarding and lower prominence of swimming at the similar sites; these two activities switch places in terms of rank in the list. The top four activities account for about 60% of the visitors surveyed. The remaining 33 activities in the list were typically identified as a primary activity by fewer than five of the 267 visitors who responded to the question.

Also matching responses from Lake Oroville, the most common primary activities are water-dependent activities. Those who listed non-water-based primary activities (e.g., relaxing, picnicking, and tent camping) may have been pursuing those activities on the water or shoreline and those visitors most often participated in other, water-based, activities in addition to their primary activity.

Table 4.44 Primary Activity During Current Visit to the Lake Oroville Area and Similar Sites

	Lake Oroville Area (%)	Similar Sites (%)
Waterskiing/wakeboarding	10	20
Motorboating	13	16
Relaxing	6	13
Swimming	16	12
Personal watercraft use	5	6
Tent camping	4	6
Boat fishing	8	6
RV Camping	2	4
Bank fishing	11	3

Note: Most of the remaining 33 activities were each specified as visitor's primary activity by less than 5 respondents.

4.1.2.2 Perceptions of Conditions at Similar Recreation Sites

A similar suite of questions to those asked at Lake Oroville on visitors' perceptions of the natural resource and social conditions they experienced during their visit were asked at the similar recreation sites. These include questions on visitors' perceptions of crowding and scenic quality at recreation areas.

Perceptions of Crowding at Recreation Areas

Visitors to the three similar sites were asked how crowded they felt at the recreation area they were using (see Table 4.45). Duplicating the Lake Oroville Area visitor survey, respondents used a nine-point scale to indicate their perception with a value of 1 labeled "not at all crowded" and 9 labeled "extremely crowded." The values of 3 and 6 were labeled as "slightly" and "moderately crowded," respectively.

Although more than half of the visitors gave a response of 1, 2, or 3—the low end of the scale—this was a lower percentage than at the Lake Oroville Area, where 68% gave those responses. In contrast, about 16% gave responses at the high end of the scale (responses of 7, 8, or 9). Overall, these responses convey a low level of concern about crowding felt by most visitors and at most locations, although concern appears to be somewhat higher than at Lake Oroville. The mean crowding rating for Lake Oroville was 3.1, while it was 3.9 for the similar sites.

Table 4.45 Perceptions of Crowding at Lake Oroville Area and Similar Sites		
	Lake Oroville Area (%)	**Similar Sites (%)**
1—Not at all crowded	42	21
2	12	12
3—Slightly crowded	14	21
4	5	9
5	6	4
6—Moderately crowded	12	16
7	4	7
8	2	4
9—Extremely crowded	4	5
Total	**100**	**100**
Mean response: 3.9/9.0 (Lake Oroville Area: 3.1/9.0)		

Perceptions of Scenic Quality at Recreation Areas

Using a similar scale to that used for the question on visitors' perceptions of crowding, visitors were asked to rate the quality of the scenery at the recreation area where they were surveyed (see Table 4.46). Once again, four values on the scale were labeled: 1 = extremely unappealing, 3 = unappealing, 6 = appealing, 9 = extremely appealing.

The most frequent response, comprising about 40% of the total, was 6. More than 70% of responses were clustered in the upper-middle range of 5, 6, and 7. Another 17 percent were at the highest end of the scale (value of 9). The mean response was 6.5. Similar to those from the Lake Oroville Area, these responses reveal that most visitors have a favorable opinion of the scenery around the recreation areas they used, although not necessarily the most favorable assessment possible.

Table 4.46 Perceptions of Quality of Scenery at Lake Oroville and Similar Sites

	Lake Oroville Area (%)	Similar Sites (%)
1—Extremely unappealing	2	1
2	1	<1
3—Unappealing	4	1
4	5	5
5	14	13
6—Appealing	34	40
7	17	18
8	8	6
9—Extremely appealing	16	17
Total	**100**	**100**
Mean response: 6.5/9.0 (Lake Oroville Area: 6.3/9.0)		

4.1.2.3 Overall Satisfaction with Recreation Experience

Visitors were asked at similar sites, as at the Lake Oroville Area, how satisfied they were overall with their recreation experience during their visit (see table 4.47). Visitors chose one response from a 9-point scale, ranging from "extremely dissatisfied" at one end to "extremely satisfied" at the opposite end. For the purposes of data coding and calculating a mean response, responses were assigned values from 1 ("extremely dissatisfied") to 9 ("extremely satisfied"); thus, higher values indicate a higher level of overall satisfaction.

Similar to the findings for the Lake Oroville Area, a strong majority of visitors were positive in their overall evaluation of their visit, although relatively few were "extremely satisfied." Responses of "satisfied" and "very satisfied" were most frequent by a wide margin, accounting for about 60% of responses, just as at the Lake Oroville Area. Some differences appear at the extremes of the scale. However, a somewhat higher proportion (15%) gave the most positive evaluation of "extremely satisfied," while at the low end of the scale only 6% indicated they were "dissatisfied" to "extremely

dissatisfied," as compared to 12% for the Lake Oroville Area. Due to these differences at the low and high ends of the scale, the mean response was a slightly higher 7.0 out of a possible 9, which equates to mean response of "satisfied."

Table 4.47 Overall Satisfaction with Recreation Experience on Recent Trip to Lake Oroville and Similar Site Lakes

	Lake Oroville Area (%)	Similar Sites (%)
1—Extremely dissatisfied	3	1
2—Very dissatisfied	6	3
3—Dissatisfied	3	2
4—Somewhat dissatisfied	5	2
5—Neither dissatisfied or satisfied	4	8
6—Somewhat satisfied	9	8
7—Satisfied	31	37
8—Very satisfied	29	24
9—Extremely satisfied	9	15
Total	**100**	**100**
Mean response: 7.0/9.0 (Lake Oroville Area: 6.6/9.0)		

4.1.2.4 Similar Recreation Site Visitors' Use and Perceptions of Lake Oroville

The final section of the on-site survey administered at the similar site lakes asked visitors if they had ever been to Lake Oroville and, if not, why not. Those who had not been to Lake Oroville were also asked whether certain special events or facilities would motivate them to visit for the first time. Those who had been to Lake Oroville were asked about the number of visits they had made to the area in the last year, when their last visit occurred, and their overall satisfaction with their last visit to the area.

Past Visitors to Lake Oroville at Similar Sites

Slightly less than one-third of the visitors surveyed at the similar site lakes had been to Lake Oroville (see Table 4.48). Those who had been to Lake Oroville were then asked three questions about those visits and their satisfaction with their last visit.

Table 4.48 Past Visitors to Lake Oroville		
	Frequency	**Percent**
Yes, have visited Lake Oroville	91	31
No, have not been to Lake Oroville	202	69
Total	**293**	**100**

Visits to Lake Oroville in Last Year

Most visitors to the similar sites who have been to Lake Oroville are infrequent visitors to the area (see Table 4.49). About half of those who had been to Lake Oroville had not visited in the last year, and about one-quarter had been there only once in the last year. Relatively few had made more than 3 visits to Lake Oroville in the last year.

Table 4.49 Number of Visits to Lake Oroville in Past Year		
	Frequency	**Percent**
0 visits	45	50
1 visit	23	26
2-3 visits	11	12
4-10 visits	10	11
> 10 visits	2	1
Total	**91**	**100**
Mean response: 1.3 visits		

Time Since Last Visit

As noted above, about half of those who had been to Lake Oroville in the past had been there in the last year (see Table 4.50). Another 15 percent had been to the area between one and two years ago, while about one-quarter hadn't been to Lake Oroville for more than 2 years. About 11% couldn't remember how long it had been; perhaps it can be safely assumed that those visitors hadn't been to Lake Oroville in the last year.

Table 4.50 Time Since Last Visit to Lake Oroville		
	Frequency	**Percent**
Within the last 12 months	46	50
1-2 years	14	15
2-3 years	7	8
> 3 years	15	16
Can't remember	10	11
Total	**91**	**100**

Satisfaction with Last Visit

About 29% of past visitors to Lake Oroville gave a rating of 7 or "satisfied," the most frequent response (see Table 4.51). However, the next most common response, given by over 20% of visitors, was the neutral response of 5 or "neither dissatisfied or satisfied." Nearly one-quarter expressed some level of dissatisfaction, from "somewhat" to "extremely dissatisfied." The mean satisfaction score of 5.7 was nearly a full point on the scale lower than the mean score given by Lake Oroville visitor survey respondents, which was 6.6.

Table 4.51 Overall Satisfaction with Recreation Experience on Recent Trip to Similar Site Lakes		
	Frequency	**Percent**
1—Extremely dissatisfied	3	4
2—Very dissatisfied	4	5
3—Dissatisfied	6	7
4—Somewhat dissatisfied	6	7
5—Neither dissatisfied or satisfied	17	21
6—Somewhat satisfied	11	13
7—Satisfied	24	29
8—Very satisfied	6	7
9—Extremely satisfied	5	6
Total	**82**	**100**
Mean response: 5.7/9.0 (vs. 6.6 for Oroville visitors)		

4.1.3 Household Survey Results

After ascertaining that the respondents had heard of the Lake Oroville Area, surveyors asked whether they had ever visited the area. In the total sample of 400 respondents, 62% reported they had visited the Lake Oroville Area (see Table 4.52). Nearly all the

people surveyed in Butte County had visited the area (98%); roughly half of the residents from the three more distant areas who had heard of Lake Oroville had visited it.

Respondents who had visited the Lake Oroville Area (n=249) were then asked some Oroville-specific questions: number of visits per year, satisfaction level of last visit, reasons for dissatisfaction (for those who responded in the "very dissatisfied" or "somewhat dissatisfied" categories), time since last visit (or reasons for not visiting within the last two years for those who had not), and special events or facilities that might motivate more frequent visits. Those who had not ever visited the Lake Oroville Area (or who were "not sure") were asked why, and whether special events or facilities might motivate a first visit.

Table 4.52 Percentage of People Who Have Visited the Lake Oroville Area

	All Sub-groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
Yes	62%	98%	50%	45%	56%
No	36%	2%	48%	50%	44%
Not Sure	2%	0%	2%	5%	0%
Total Respondents = 400					

Data from Past Visitors

Table 4.53 indicates that nearly half of the respondents who had visited the Lake Oroville Area in the past are infrequent visitors, with only one visit or less per year overall, and roughly two-thirds for those outside Butte County. As might be expected, a much higher percentage from Butte County visit more frequently, with 62% visiting three times a year or more.

Table 4.53 Annual Visits

	All Sub-groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
<1/year	46%	14%	66%	71%	63%
1-2/year	24%	24%	30%	11%	29%
3+/year	31%	62%	4%	18%	9%
Total Respondents = 249					

The overall satisfaction with the Lake Oroville Area is fairly high, with 74% of respondents rating their opinion as "somewhat," "very" or "extremely satisfied" (see Table 4.54). The range for visitors from all three out-of-town areas was heavily concentrated in a mid-high range of satisfaction, with 80-90% falling between neutral and "very satisfied." Responses from Butte County residents showed a higher number of somewhat or very dissatisfied visitors (21% combined).

Table 4.54 Satisfaction with Last Visit

	All Sub-Groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
Very Dissatisfied	2%	6%	0%	0%	0%
Somewhat Dissatisfied	8%	15%	4%	4%	4%
Neither Dissatisfied or Satisfied	15%	11%	20%	18%	14%
Somewhat Satisfied	35%	24%	40%	40%	48%
Very Satisfied	30%	34%	24%	29%	29%
Extremely Satisfied	9%	10%	12%	9%	5%
Total Respondents = 249					

For those dissatisfied with their visit to the Lake Oroville Area (the majority of whom, 21 of 27 respondents, were from Butte County), the reasons varied (see Table 4.55). The largest numbers of respondents were unhappy with the fluctuating or low lake level. Lack of facilities was also cited by about a third of the dissatisfied respondents as a problem. Fewer people felt the area was too trashy or not well maintained, was too unnatural in appearance, and/or did not provide a good fishing experience.

Table 4.55 Reason for Dissatisfaction w/Last Visit (those who responded "very" or "somewhat dissatisfied") (open-ended)

	All Sub-groups	Butte County (n=21)	Reno Area (n=2)	San Fran. Area (n=2)	Sacramento Area (n=2)
Lake Level Fluctuates/Too Low	44%	57%	0%	0%	0%
Lack of Facilities	30%	29%	0%	50%	50%
Trashy/Not Kept Up	19%	14%	100%	0%	0%
Other	19%	14%	50%	0%	50%
Too Unnatural	7%	5%	0%	50%	0%
Need Better Fishing/Stock Lake	7%	10%	0%	0%	100%
Total Respondents = 27					

Table 4.56 indicates that over half (57%) of those who had visited the area had done so within the past twelve months. Substantially higher numbers of residents from Butte County had visited within the last year (88%), as compared to a consistent percentage of roughly 35-40% from the more distant areas. Very few respondents had visited 1-2 or 2-3 years ago, but a large group from the three outlying areas (40-45%) had visited more than three years ago. This seems to indicate that people are generally either regular visitors on an annual basis, or visit very infrequently.

Table 4.56 Last Time Visited

	All Sub-groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
Within Last 12 months	57%	88%	34%	40%	36%
1-2 Years Ago	9%	4%	14%	9%	14%
2-3 Years Ago	5%	3%	10%	2%	7%
More than 3 Years Ago	27%	5%	40%	44%	41%
Total Respondents = 249					

Those who had not visited the area in the last two years were asked their reasons for staying away (see Table 4.57). The most common reason (32% for all subgroups) was simply a preference for other places, rather than any specific about the area itself. A substantial number of visitors from outlying areas (roughly 20-25%) felt the area was too far away to visit.

Table 4.57 Reason for Not Visiting in Last 2 Years (those who have not visited the Lake Oroville Area in the last 2 years) (open-ended)

	All Sub-groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
Prefer Other Places	32%	50%	35%	17%	36%
Personal Reasons	26%	13%	27%	26%	29%
Too Far	20%	0%	23%	26%	18%
Prefer Closer Places	11%	0%	15%	13%	7%
Don't Like the Place/Something in Particular There	11%	0%	8%	17%	11%
Too Hot There	6%	13%	4%	9%	4%
Total Respondents = 85					

**No more than 3 respondents in any study area answered don't know, have no boat and need one for there, have cabin/boat elsewhere, too crowded, or nothing there/no reason to go back.*

Respondents who have visited the Lake Oroville Area in the past were asked about special events that would motivate them to visit more often (see Table 4.58). Among all respondents the most popular response was fishing events (37%), followed by food/beverage festivals (25%), and water-skiing events (24%). This order of priorities was the same for Butte County residents, but differed among respondents from more distant origins. For example, respondents from the San Francisco area listed food/beverage festivals as their most popular choice, followed closely by fishing events, and canoe/kayak/river-related events. For visitors from the Sacramento area, fishing events was the most popular activity to motivate them to visit more often, and was mentioned by a substantially larger proportion than the second and third choices (46% compared to 25% and 23%, respectively).

Table 4.58 Special Events as Motivation to Visit More Often

	All Sub-groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
Fishing Events	37%	41%	30%	24%	46%
Food/Beverage Festivals	25%	32%	14%	27%	20%
Water-skiing Events	24%	28%	28%	11%	23%
Powerboat Races	22%	26%	20%	13%	25%
Canoe/Kayak/River-Related Events	22%	25%	20%	24%	16%
Living History Demonstrations	16%	22%	8%	7%	18%
Mountain Bike Races	15%	13%	24%	16%	11%
PWC Events	14%	17%	14%	4%	16%
None of the Above	14%	7%	18%	20%	16%
Target Shooting Competition	13%	14%	14%	13%	11%
OHV Related Events	12%	14%	10%	0%	21%
Sailing Events	12%	13%	10%	16%	7%
Triathlons	10%	13%	4%	11%	9%
Equestrian Events	9%	11%	4%	9%	9%

Total Respondents = 249

**No more than 5 respondents answered other, don't know, or wake/knee boarding.*

Respondents who had visited the Lake Oroville Area were also asked about what types of facilities would motivate them to visit more often (see Table 4.59). Among all respondents the most popular choice was a floating restaurant (39%), closely followed by warm water swimming/beach areas (38%) and showers at day use areas (37%). Respondents from Butte County and the Sacramento Area generally responded in larger numbers to all possible facilities than those from Reno or the San Francisco Areas.

Table 4.59 Facilities as Motivation to Visit More Often

	All Sub-Groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
Floating Restaurant at Lake Oroville	39%	50%	22%	29%	41%
Warm-water Swimming/Beach Areas	38%	44%	24%	36%	41%
Showers at Day Use Areas	37%	40%	28%	31%	45%
Expanded Outdoor/Nature/Cultural/ Historic Interpretation Center	31%	34%	24%	22%	38%
Water Park	30%	39%	20%	16%	34%
Children's Play Areas	28%	33%	8%	27%	38%
More Full Hookup RV Sites	22%	27%	12%	22%	21%
More RV Sites Accessible to People with Disabilities	19%	27%	4%	18%	21%
None of the Above	14%	7%	28%	18%	11%

Total Respondents = 249

**No more than 5% of all respondents answered various types of camping sites, other, marina/boat launching facility, don't know, more water in reservoir, restaurants, trails, or cabins.*

Table 4.60 indicates open-ended responses to the other types of facilities desired at Lake Oroville. Various types of camping sites are the most frequently mentioned item among respondents with an opinion from the San Francisco group (25%). For the Reno group, fishing-related facilities was the most frequently mentioned item (40% of those with an opinion). Respondents from the Butte County group did not have a single first choice; three items (marina/boat launch facilities, expanded nature/cultural center, and fishing related facilities) all received 11% of the total responses.

Table 4.60 Other Facilities Wanted at Lake Oroville (open-ended)

	All Sub-groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
Various Types of Camping Sites	12%	11%	20%	25%	0%
Marina/Boat Launching Facility	10%	11%	20%	0%	9%
Expanded outdoor /nature/cultural/ historic interpretation center	7%	11%	0%	0%	9%
Fishing-Related Facilities	7%	0%	40%	13%	0%

Total Respondents = 42

**A total of 2 respondents answered floating restaurant on Lake Oroville, warm-water swimming/beach areas, more water in reservoir, restaurants, trails, and more restrooms. 19 other responses were each mentioned by one respondent.*

Data from those who have never visited the Lake Oroville Area

Approximately 40% of the total sample stated they had never visited the Lake Oroville Area, though they had heard of it (see Table 4.61); this sample only included two individuals from Butte County. The most frequently cited reason for all respondents was insufficient knowledge about the area, given by 40-50% of all groups except the Sacramento area group. The second most frequently mentioned reason was that Lake Oroville was too far from their homes. For all respondents, a very small percentage (5-6%) indicated they were not interested in water-related recreation.

A small subset of respondents (n=19) had never visited the Lake Oroville Area because they preferred to go to other lakes. These respondents were asked what other lake came to mind as their preferred choice. The most popular lake for the Reno group was Lake Tahoe (63%). Equal numbers of people from the San Francisco area mentioned Lake Tahoe and Lake Berryessa (17% each), although the majority (67%) listed other lakes not on the questionnaire. For the Sacramento area, the most popular lake was Folsom Lake (40%).

Table 4.61 Reason for Not Visiting Lake Oroville

	All Sub-Groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
Don't Know Enough about Area that Would Motivate me to Visit	42%	50%	44%	51%	27%
It is too Far from my Home	31%	0%	42%	29%	23%
Prefer to go to Other Lakes	13%	0%	16%	11%	11%
Prefer Different Setting	8%	0%	8%	11%	5%
No Time/Personal Reasons	6%	0%	0%	4%	16%
Total Respondents = 151					

**No more than 5% of all respondents answered other, no reason, too hot there, not enough trees, don't know, it is not located on a major highway, too many people, or not interested.*

Table 4.62 reports results from a question asked of those who had never visited the Lake Oroville Area (n=151). The question asked respondents to list in an open-ended manner what special events would motivate them to visit the Lake Oroville Area for the first time. Most said "none" or gave no answer. Among those who gave some response other than "none", a substantial proportion (39%) of respondents from the Sacramento group indicated they would need more information about Lake Oroville. (100% of the Butte County respondents needed more information, but this only represented two respondents.) For the San Francisco group the most frequently cited response was "don't know." For the Reno group the response "don't know" was matched by "boat/water events" as the most frequently cited response (22% each).

Table 4.62 Special Events as Motivation to Visit for the First Time (open-ended)

	All Sub-groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
Need More Info About Place	26%	100%	17%	19%	39%
Don't Know	19%	0%	22%	24%	11%
Boat/Water Events	16%	0%	22%	14%	11%
Concerts	9%	0%	6%	5%	17%
July 4th Events/ Fireworks	7%	0%	6%	0%	17%
Historical/Cultural/ Exhibits	5%	0%	0%	10%	6%
Total Responses = 58 (Gave responses other than "none")					

**No more than 2 respondents answered parades/bands, contest and pageants, animal events, off-road/motocross/roller derby, camping events, children's events, fishing events, or other.*

Table 4.63 shows results to a question where the interviewer read a number of possible special events to the respondents and asked which might motivate their first visit to the Lake Oroville Area. About one-quarter of all respondents mentioned food/beverage festivals, canoe/kayak/river related events, and fishing events almost equally as motivation. For the Butte County group, responses were split between food/beverage festivals and fishing events, but again this only represents two respondents.

Table 4.63 Special Events as Motivation to Visit for the First Time (close-ended)

	All Sub-groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
Food/Beverage Festivals	25%	50%	24%	24%	27%
Canoe/Kayak/River-related Events	24%	0%	18%	26%	30%
None of the Above	23%	0%	28%	29%	11%
Fishing Events	22%	50%	28%	20%	16%
Powerboat Races	20%	0%	18%	18%	25%
Living History Demos.	17%	0%	16%	11%	27%
Water-skiing Events	15%	0%	14%	18%	14%
Target Shooting Competition	15%	0%	18%	15%	11%
Mountain Bike Races	13%	0%	12%	13%	16%

Total Responses = 151*

**No more than 10% of all respondents answered equestrian events, OHV related events, sailing events, triathlons, PWC events, or don't know.*

Table 4.64 shows results of an open-ended question about what recreation facilities would motivate respondents to visit the area for the first time. The item pertaining to campgrounds was the top choice for the San Francisco and Sacramento area groups (roughly 30% each). For the Butte County and Reno area groups, various types of trails and/or rock climbing were the top choices, although for the latter group an identical proportion of respondents gave a "don't know" response.

Table 4.64 Outdoor Rec. Facilities as Motivation to Visit for the First Time (open-ended)

	All Sub-groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
Campgrounds	25%	0%	16%	29%	31%
Don't Know	19%	0%	26%	13%	25%
Hiking/Biking Trails/ Rock Climbing	18%	100%	26%	16%	6%
Sailing/Kayaking/ Rafting/Canoeing/ Boating/Waterskiing/ Parasailing	13%	0%	0%	26%	6%

Total Responses = 67* (Gave responses other than "none")

**No more than 5% of all respondents answered boat rental/houseboat rental, swimming facilities/waterpark, RV hookups, cabins, hotels & restaurants/spa retreat, fishing rentals & facilities, other, showers & restrooms, game hunting, or PWC facilities.*

Table 4.65 shows responses to a question about what facilities would motivate respondents to visit the Lake Oroville Area for the first time. A floating restaurant on Lake Oroville was the top choice for all groups (37%). The second most popular choice for all respondents to the question were expanded outdoor/nature/cultural center (31%), closely followed by warm-water swimming and/or beach areas (30%).

Table 4.65 Facilities as Motivation to Visit for the First Time

	All Sub-Groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
Floating Restaurant on Lake Oroville	37%	50%	32%	40%	39%
Expanded outdoor/nature /cultural/historic interp. Center	31%	0%	24%	36%	32%
Warm-water swimming/beach areas	30%	0%	34%	26%	32%
Water Park	27%	0%	24%	33%	25%
Showers at Day Use Areas	26%	50%	28%	24%	25%
None of the Above	24%	50%	34%	16%	21%
Children's Play Areas	21%	0%	16%	22%	25%
More Full Hookup RV Sites	15%	0%	22%	11%	14%
More RV Sites Accessible to People with Disabilities	14%	0%	12%	16%	14%
Don't Know	7%	0%	4%	7%	9%
Total Respondents = 151					

Data from All Respondents

Several questions were asked of all respondents, including: amount spent on durable equipment for outdoor recreation, annual trip-related recreation expenses, and socio-demographic characteristics. Table 4.66 shows responses to the question regarding spending on durable equipment for outdoor recreation. All respondents were asked how much money they spent on durable equipment (such as a tent or fishing equipment) during the last year. The majority of respondents in all groups indicated they spent $500 or less, with little variation across groups. For example, 67% of the Sacramento group, 68% of Butte County group, and 67% of the Reno area group indicated they spent $500

or less per year on durable equipment for outdoor recreation. The San Francisco group appears to have spent the least on durable equipment, with 73% reporting they spent $500 a year or less.

Table 4.66 Amount Spent on Durable Equipment for Outdoor Recreation

	All Sub-Groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
Less than $100	26%	27%	24%	31%	23%
$100 - $250	21%	20%	23%	25%	17%
$251 - $500	21%	21%	20%	17%	27%
$501 - $1,000	15%	16%	14%	14%	15%
$1,001 - $2,500	8%	11%	5%	7%	7%
$2,501 - $5,000	4%	3%	7%	1%	5%
$5,001 - $10,000	1%	0%	2%	0%	1%
More than $10,000	1%	0%	2%	0%	1%
Don't Know/Refused	4%	2%	3%	5%	4%
Total Respondents = 400					

Table 4.67 shows the annual trip-related expenses for outdoor recreation activities for all respondents. As with durable equipment expenses, the majority of respondents indicated they spent $500 per year or less. About 60% of respondents in three of the four groups indicated they spent $500 or less, and for the Reno group 48% indicated they spent $500 a year or less. The Reno group appears to be spending the most on trip-related expenses (52% reporting they spent more than $500 per year).

Table 4.67 Trip-Related Expenses for Outdoor Recreation Activities

	All Sub-Groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
Less than $100	16%	18%	11%	11%	22%
$100 - $250	16%	20%	13%	15%	17%
$251 - $500	25%	23%	24%	32%	20%
$501 - $1,000	17%	14%	18%	20%	16%
$1,001 - $2,500	15%	13%	16%	14%	15%
$2,501 - $5,000	8%	10%	11%	4%	5%
$5,001 - $10,000	1%	0%	4%	0%	1%
More than $10,000	1%	0%	0%	0%	2%
Don't Know/Refused	3%	2%	3%	4%	2%
Total Respondents = 400					

Demographic Data

Table 4.68 shows the respondents' level of education. All four subgroups show a fairly well educated group of respondents. Nearly all (96%) graduated high school, and three-quarters (78%) have at least some college experience. The proportions were similar across all subgroups.

Table 4.68 Highest Level of Education

	All Sub-Groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
Refused	2%	1%	1%	3%	4%
Some High School	2%	2%	3%	1%	2%
High School Graduate	19%	18%	19%	21%	17%
Some College	36%	39%	38%	29%	36%
Bachelor's Degree or Equivalent	26%	25%	26%	29%	22%
Master's Degree or Equivalent	11%	11%	8%	11%	15%
Ph.D, J.D., M.D., or Equivalent	5%	4%	5%	6%	4%
Total Respondents = 400					

Table 4.69 shows results for occupation for all respondents. About one-fourth of the respondents considered their occupation to be Professional/Technical. The second most frequent response was Managers/Administrators/Self-Employed. The proportion of Operatives/Laborers from Butte County was substantially higher than for the other subgroups (12%), while the same group was proportionately much smaller from the San Francisco area (3%). Butte County also reported a higher percentage of retirees, comprising 20% of the total from that group, while the Reno and San Francisco areas only reported 11% and 12% of their respective totals as retirees.

Table 4.69 Occupation

	All Sub-Groups	Butte County	Reno Area	San Fran Area	Sacramento Area
Professional/Technical	25%	25%	29%	23%	21%
Managers/Administrators/ Self-Employed	15%	13%	13%	23%	11%
Sales/Clerical	8%	6%	7%	8%	11%
Skilled Craftsman	7%	5%	10%	4%	8%
Operatives/Laborers	8%	12%	7%	3%	8%
Service Workers /Private Household Workers	8%	6%	8%	9%	7%
Unemployed, Looking for Work	5%	2%	7%	5%	5%
Not Employed Outside the Home	6%	6%	6%	7%	6%
Retired	15%	20%	11%	12%	15%
Don't Know/Refused	4%	2%	2%	5%	8%
Student	1%	3%	0%	1%	0%
Total Respondents = 400					

Table 4.70 shows results of a question about whether respondents own their business. Most respondents in all subgroups do not own their own business (83%). San Francisco respondents have the highest proportion that reported owning a business, while the Sacramento group reported the lowest proportion.

Table 4.70 Own Your Own Business

	All Sub-groups	Butte County	Reno Area	San Fran. Area	Sacramento Area
Yes	17%	17%	17%	23%	11%
No	83%	83%	83%	77%	89%
Total Respondents = 294					

Table 4.71 shows results of a question targeted toward business owners. Among those who reported to be business owners, a small proportion indicated their business to be recreation related (14%). The Sacramento group shows the highest proportion (25%) of recreation related businesses owned by respondents.

Table 4.71 Business Involved in Recreation-Related Services or Merchandise					
	All Sub-groups	**Butte County**	**Reno Area**	**San Fran. Area**	**Sacramento Area**
Yes	14%	17%	8%	12%	25%
No	86%	83%	92%	88%	75%
Total Respondents = 50					

In another follow-up question, the seven respondents who reported their business involved recreation services or merchandise were asked directly if their business was a recreation-related service or merchandise business. Three of the seven respondents (43%) stated that they owned service businesses; the other four owned merchandise businesses.

Table 4.72 shows respondents' self-reported total household income before taxes. The Butte County group appears to report the lowest income, since they had the highest proportion of respondents that reported income of less than $40,000 per year (45%). In contrast, the San Francisco group had the highest proportion of respondents that reported income of more than $100,000 per year (30%).

Table 4.72 Total Household Income Before Taxes					
	All Sub-Groups	**Butte County**	**Reno Area**	**San Fran. Area**	**Sacramento Area**
Less Than $20,000	9%	22%	3%	6%	5%
$20,000-$40,000	18%	23%	21%	9%	18%
$40,001-$60,000	21%	20%	25%	18%	22%
$60,001-$80,000	21%	20%	17%	21%	27%
$80,001-$100,000	13%	6%	17%	16%	12%
More than $100,000	18%	9%	17%	30%	17%
Total Respondents = 341					

Table 4.73 displays respondents' self-reported ethnic group. The majority for all respondents across all subgroups identified themselves as White/Anglo. The second most frequently mentioned category was Latino or Hispanic. The largest concentration of African-Americans was in the San Francisco group, representing 7% of the total.

Table 4.73 Ethnic Group

	All Sub-Groups	Butte County	Reno Area	San Fran Area	Sacramento Area
Refused	8%	7%	7%	10%	6%
Latino or Hispanic	5%	2%	3%	10%	3%
White or Anglo (non Hispanic)	80%	81%	87%	71%	82%
Asian	2%	2%	1%	1%	3%
African-American or Black	3%	2%	1%	7%	3%
American Indian or Alaska Native	2%	6%	0%	0%	2%
Pacific Islander or Native Hawaiian	1%	0%	1%	1%	1%
Total Respondents = 400					

4.2 EXISTING USE STUDY RESULTS

4.2.1 Results of Observational Counts at Recreation Sites

This section summarizes count data obtained through on-site observation of vehicles, trailers, and recreating visitors at several types of Lake Oroville Area recreation sites. Visitors were categorized by the activity they were engaged in when observed (picnicking, swimming, bank angling, and "other" activities). The observations were conducted by field staff members when they arrived at the sites to conduct visitor surveys. Therefore, the observation schedule was the same as the recreation visitor survey schedule, with observations conducted at 8:00 am, 12:00 noon, and 4:00 pm and on weekdays, weekends, and holidays.

The data reported here varies for the different types of recreation areas. At boat launches and trailheads the most useful information is the counts of vehicles and RVs, and of RVs and vehicles with trailers, since these areas serve primarily as access points with little recreation occurring directly on-site. (At boat launches, boat trailer counts are reported, while at trailheads, horse and ORV trailer counts are reported.) At day-use recreation areas, counts of vehicles and the various types of recreationists using the areas are reported. At car-top boat ramps, vehicles, vehicles with boat trailers, and

visitor types are shown since these areas serve as access points to the water for visitors with hand-launched (and sometimes smaller trailer-launched) boats and also are used as recreation sites by shoreline picnickers, swimmers, anglers, and others. Types of vehicles and trailers not listed for a type of recreation area may have been observed at some of the sites, but typically in very low numbers.

4.2.1.1 Observations of Use at Boat Launches

Thirteen to 26 counts of vehicles and trailers were completed at the eight boat launches listed (see Table 4.74). The number of vehicles and RV's at boat launches is partly related to the presence of other recreation facilities such as a marina or day-use area adjacent to the launch. Thus, the smaller Enterprise and Wilbur Road boat ramps had the least amount of vehicle and RV traffic while the Lime Saddle and Bidwell Canyon Boat ramps had the most vehicle and RV traffic. The Lime Saddle boat ramp had the highest average number of vehicles with 44.7, followed by Bidwell Canyon with an average of 35.9 vehicles. The maximum number of vehicles observed at the Wilbur Road boat ramp was quite low at 4 vehicles, while as many as 147 vehicles were counted at the Lime Saddle boat ramp. Many of these presumably belonged to boaters with boats moored at the Lime Saddle Marina or those renting boats from the marina. The Monument Hill, South Forebay, Spillway and Loafer Creek boat ramps had fairly similar average numbers of vehicles (13.6, 12.5, 16.4, and 18.1, respectively) even though the maximum number of vehicles varied from 19 at South Forebay to 89 at Loafer Creek. Many of the vehicles parked at Monument Hill would be expected to belong to users of the small beach area adjacent to the launch, which is popular with users of personal watercraft. Similarly, most vehicles at the South Forebay area would belong to bank anglers and other users of a small picnic area close to the launch.

Table 4.74 Summary of Visitor Use Observation Data at Boat Launches

Site	# of Counts	Vehicles		RV's		Vehicles & RV's w/Boat Trailers			
		Max. # of Vehicles	Avg. # of Vehicles	Max. # of RV's	Avg. # of RV's	Max. # of Vehicles w/boat trailers	Avg. # Vehicles w/boat trailers	Max. # of RV's w/boat trailers	Avg. # of RV's w/boat trailers
Lime Saddle Boat Launch	26	147	44.7	4	0.8	168	39.8	1	0.1
Enterprise Boat Launch	13	22	4.1	0	0	5	1.1	0	0
Loafer Creek Boat Launch	13	89	18.1	2	0.5	94	40.2	2	0.2
Bidwell Cyn. Boat Launch	22	114	35.9	11	1.5	315	111.2	2	0.4
Spillway Boat Launch	19	53	16.4	2	0.2	179	56.1	1	0.3
Monument Hill Boat Launch	18	40	13.6	2	0.2	47	14.1	1	0.1
Wilbur Rd Boat Launch	17	4	1.3	0	0	15	4.9	0	0
S. Forebay Boat Launch	17	19	12.5	2	1.2	6	2.9	0	0

Note: Both Monument Hill and South Forebay Boat Launches also have small day-use facilities.

Compared to the number of vehicles, there were substantially fewer RV's at all of the boat ramps. Bidwell Canyon had the most RV's observed at one time with 11 and the Enterprise and Wilbur Road ramps had the least with zero. Bidwell Canyon also had the highest average number of RV's with 1.5, while the average was less than one for the other seven sites.

The primary indicator of launch area use among these observations is the number of vehicles with boat trailers present. Bidwell Canyon boat ramp had the highest amount of boat trailers present, by a substantial margin, with a maximum of 315 vehicles with boat trailers observed at one time. This is 136 more vehicles with boat trailers than the maximum observed at Spillway boat ramp which had the second largest maximum with 179. The average number of vehicles with boat trailers at Bidwell Canyon was about 111, which was almost double that of Spillway which had the second highest average of

56.1. The maximum number of RV's with boat trailers at any ramp was 2 (Bidwell Canyon and Loafer ramps), showing relatively little RV with boat trailer usage occurs.

4.2.1.2 Observations of Use at Trail Access Areas

Five to 23 counts of vehicles and trailers were completed at the five trail access points (see Table 4.75). The observations suggest that four of the five trail access areas have little usage by visitors in vehicles without trailers (e.g., hikers and bike riders). Loafer Creek Equestrian Camp had the highest maximum number of vehicles observed with 13 vehicles at one time. The second highest maximum observed was 3 vehicles at the Saddle Dam trail access. The Powerhouse and East Hamilton Road trail accesses had no vehicles present when the first 5-6 counts occurred at those locations. (This low level of use resulted in these sites being removed from the survey schedule mid-way through the summer.) The two other trail access areas had very low vehicle usage (maximums of 2 and 3 vehicles for Lakeland Blvd. and Saddle Dam, respectively). Four of the five trail access areas had no RVs present during any of the counts, while the Loafer Creek Equestrian Camp had a maximum of 2 RVs. All but the East Hamilton Road Trail Access can be used by equestrian users with horse trailers.

Probably due to its nature as both a destination-point and trail access point for equestrian visitors, Loafer Creek Equestrian Camp had the highest maximum number of vehicles with horse trailers with 12. The other four trail access points had notably fewer horse trailers observed, with a maximum of 5 at Lakeland Blvd., 3 at Saddle Dam, and 1 at the Powerhouse Road site. Only the Loafer Creek Equestrian Campground had any RV with horse trailer use with a maximum of 3 and an average of less than one RV's with horse trailers.

Table 4.75 Summary of Visitor Use Observations at Trail Access Areas

Site	# of Counts	Vehicles		RV's		Vehicles & RV's w/Horse Trailers			
		Max. # of Vehicles	Avg # of Vehicles	Max. # of RV's	Avg # of RV's	Max. # of Vehicles w/horse trailers	Avg # Vehicles w/horse trailers	Max. # of RV's w/horse trailers	Avg # of RV's w/horse trailers
Saddle Dam Trail Access	19	3	0.5	0	0	3	0.5	0	0
Powerhouse Rd Trail Access	6	0	0	0	0	1	0.2	0	0
Lakeland Blvd. Trail Access	23	2	0.3	0	0	5	0.2	0	0
E. Hamilton Rd Trail Access	5	0	0	0	0	0	0	0	0
Loafer Creek Equestrian Camp	12	13	1.8	2	.5	12	3.2	3	.5

Note: Although Loafer Creek is not a trail access area, it is included in this group because it is a major trail access point for equestrian trail users.

Overall, these data suggest that all four trail access areas receive low use at most times. The East Hamilton Road and Powerhouse Road trail access areas appear to be almost unused. The data indicates that the Loafer Creek Equestrian Camp, with its special facilities, receives the most usage.

4.2.1.3 Observations of Use at Day Use Areas

Twelve to 25 observations of vehicles and visitors on site were made at six day use areas (see Table 4.76). In addition to a boat ramp, the Monument Hill area contains day-use facilities that were found to receive a high level of use at times (higher than all but one other day use area).

Among the six areas, the North Forebay area is clearly unique in its consistently high amount of use. The maximum of 470 vehicles counted there (on the July 4th holiday) was over 13 times larger than the next largest maximum of 36 vehicles, at Riverbend

Park. On four other occasions over 100 vehicles were counted at North Forebay. The maximum number of visitors for North Forebay was 977 (also on July 4th), over nine times as many people as the second highest maximum of 108 visitors at Monument Hill. The average number of visitors at North Forebay Day Use Area was more than four times as large as the average number of visitors to Monument Hill.

Table 4.76 Summary of Visitor Use Observations at Day Use Areas

Site	# of Counts	Vehicles	Visitors		Visitor Activities			
		Max. # of Vehicles	Max. # of People	Avg # of People	Avg # of Picnickers	Avg # of Swimmers	Avg # of Bank Anglers	Avg # of Other Area Users
Loafer Creek Day Use Area	12	8	24	3.4	0.3	0.8	0.2	2.1
Dam/Overlook Day Use Area	19	16	28	5.9	0.5	0	0	5.8
Diversion Pool Day Use Area	16	5	33	3.6	0	0.7	1.6	1.3
N. Forebay Day Use Area	19	470	977	156.7	87.2	49.1	0.7	24.4
Monument Hill Day Use Area	18	40	108	34.8	15.7	7.6	0.5	11.1
Riverbend Park / Ponds	25	36	59	17.8	1.7	1.7	7.4	7.1

Note: The Monument Hill area is included here, as well as in the Boat Launch table, because the day use facilities (primarily the small beach adjacent to the launch) was found to receive considerable use.

As for visitor activities, North Forebay also stands out in terms of the average number of picnickers (nearly 90) and swimmers (about 50) during individual survey counts. This was about six times as many picnickers and swimmers as the Monument Hill area. The average number of these types of users at the other day use areas was less than two. The primary activity observed at Riverbend Park was bank angling (about 7 per visit) along with walkers and bike riders using the paved trail and fitness stations. The Diversion Pool typically was being used by a few bank anglers and a few visitors using non-powered boats (canoes and kayaks) each visit. The average of six “Other” users at the Dam Overlook area were primarily sightseers and those who come to walk or ride a bike across the dam.

Excluding the North Forebay Day Use Area, the highest number of vehicles and visitors at one time were both observed at Monument Hill with 40 vehicles and 108 visitors. The average number of visitors at that area was about 35, though some vehicles belonged to visitors who were boating and thus not included in the visitor counts. The Dam/Overlook, Diversion Pool and Loafer Creek day use areas had similar maximum numbers of visitors (28, 33, 24 respectively), which were about one-quarter to one-third the maximum number of visitors to Monument Hill. However, the average number of visitors at the Dam/Overlook, Diversion Pool and Loafer Creek day use areas (between about 3 and 6 at each site) was much lower than the maximum numbers observed.

4.2.1.4 Observations of Use at Car-top Accesses

Eight to 15 observations were completed at the six car-top accesses (see Table 4.77). Fewer visits were made to the Vinton Gulch and Dark Canyon sites because they became unusable for most visitors by mid-summer due to the low elevation of Lake Oroville and were removed from the survey schedule. The data show that the other four car-top accesses received similar amounts of use, as indicated by the maximum number of vehicles present at one time (16 to 21) and the maximum number of visitors present at one time (39 to 49 at three of the sites and 25 at another).

The data also indicates that all of the car-top accesses receive light amounts of boat launching activity and, with the exception of Larkin Road, that shoreline visitor use is the larger use of the area. In terms of on-site visitors present at one time, Nelson Bar had the highest maximum (49) followed closely by Stringtown (44). Dark Canyon had a maximum of only 6 people and Vinton Gulch had no visitors during any of the eight visits

there. Nelson Bar, Stringtown and Larkin Road all had a similar average of about 12 visitors each visit.

Table 4.77 Summary of Visitor Use Observations at Car-Top Accesses

Site	# of Counts	Vehicle	Trailers	Visitors		Visitor Activities			
		Max. # of Vehicles	Max. # of Vehicles w/boat trailers	Max. # of People	Avg # of People	Avg # of Picnickers	Avg # of Swimmers	Avg # of Bank Anglers	Avg # of Other Area Users
Dark Canyon Car-top Access	8	4	5	6	3.1	0	0.4	0	2.8
Nelson Bar Car-top Access	10	18	1	49	12.3	0.6	3.0	1.4	7.3
Vinton Gulch Car-top Access	8	1	0	0	0	0	0	0	0
Foreman Cr. Car-top Access	15	21	6	25	10.1	0.3	2.4	1.4	6.2
Stringtown Car-top Access	14	20	5	44	12.6	0.4	4.4	0.9	7.0
Larkin Road Car-top Access	14	16	14	39	12.2	1.4	2.4	0	8.4

As for activities by visitors, there were very few picnickers and bank anglers, and only a few more swimmers using most areas. More prominent were “other” areas uses, typically launching of non-powered and smaller power boats and personal watercraft and walking the shoreline. The shorelines at all but the Larkin Road area (on the Afterbay) are increasingly steep and/or muddy as Lake Oroville falls in elevation, reducing suitability for picnicking, swimming, and bank angling.

4.2.1.5 Observations of Use at the Oroville Wildlife Area and Clay Pit Facilities

Four sites within Oroville Wildlife Area and two locations within the Clay Pit were the subject of from five to 18 observations (see Table 4.78). Several of the sites are primarily used by visitors seeking boat or foot access to the Feather River. The two Clay

Pit sites—the State Vehicular Recreation Area (SVRA) and the Shooting Area—are used solely by motorcycle and off-road vehicle users and target shooters, respectively.

The levee road on the west side of the Feather River (accessed from Vance and Palm Avenues and running for more than a mile parallel to the river) had the highest maximum number of vehicles observed with 63. A nearly-as-high 46 were counted at one time at the Afterbay Outlet. A moderate number of vehicles wwere observed at the Headquarters Entrance (primarily at a gravel boat launch on the river and at nearby areas providing river access to wading anglers). The same moderate level of use was observed on the levee road on the east side of the Feather River (accessed from the Pacific Heights Road and Highway 70 entrances), which is also used primarily by bank and wading anglers. The lowest use is clearly at the two Clay Pit areas with a maximum of 9 vehicles at the Shooting Area and 3 at the State Vehicular Recreation Area.

As for vehicles with boat trailers, only the West Levee Road had a substantial number of trailers present with a maximum of 18 observed at several gravel launch sites on the river. As many as nine vehicles with boat trailers were seen at the Afterbay Outlet although there is no launch site there. No vehicles with boat trailers were observed at the other sites, although the gravel ramp near the Headquarters entrance does provide river access for boats.

Moving to counts of visitors, the West Levee Road had the highest maximum with 95 people, followed closely by the Afterbay Outlet with 94 people. The Clay Pit sites had the smallest maximum number of visitors with 9 people at the SVRA and 11 people at the Shooting Area. The West Levee Road also had the highest average number of people (57.5) followed by Afterbay Outlet with a 40.6 person average. The average

drops significantly to about 17 people at the East Levee Road. The Clay Pit SVRA had the smallest average number of visitors (only about three people).

Table 4.78 Summary of Visitor Use Observations at Oroville Wildlife Area and Clay Pit

Site	# of Counts	Vehicles	Trailers	Visitors		Visitor Activities			
		Max. # of Vehicles	Max. # of Vehicles w/boat trailers	Max. # of People	Avg # of People	Avg # of Picnickers	Avg # of Swimmers	Avg # of Bank Anglers	Avg # of Other Area Users
Headquarters Entrance Road	15	26	0	53	14.1	0	0	16.1	1.53
Afterbay Outlet	11	46	9	94	40.6	3.6	0.8	25.0	10.3
Levee Road—West side of Feather River	18	63	18	95	57.5	1.6	2.2	32.5	12.1
Levee Road—East side of Feather River	13	20	1	36	17.4	0.2	0.5	11.9	4.8
Clay Pit State Vehicular Rec. Area	9	3	0	9	2.9	0	0	0	2.9
Clay Pit Shooting Area	5	9	0	11	4.8	0	0	0	4.8

The data on specific activities indicate that, except for the Clay Pit areas, these sites were primarily used by bank anglers. There was relatively little picnicking or swimming use of any of the sites. The West Levee Road had the highest average number of bank anglers with 32.5 anglers, the Afterbay Outlet was second with an average of 25 anglers, followed by an average of about 16 anglers for the Headquarters entrance and an average of 12 at the East Levee Road.

4.2.2 Summary of Data from Recreation Site Traffic Counters

Data from the 26 DWR-monitored traffic counters within LOSRA and OWA for 2002 have been received. The data are comprised of daily vehicle counts for 14 LOSRA and 3

Thermalito Afterbay recreation sites, 6 OWA entrances, and the Feather River Fish Hatchery. Analysis of these data is ongoing and results will be included in the critical path studies final report.

4.2.3 Summary of Data from Infrared Trail Counters

Passive infrared trail use counters have been placed at four different locations on the Lake Oroville Area trail system. The counters' memory stores one count each time anything crosses the infrared beam. The counters cannot differentiate between human and animal use of trail. The counters can be programmed to record in their internal memory hourly or daily counts. All are currently programmed to record hourly data.

The data sets, for analysis purposes, have been truncated to only include daylight hours. The night time periods have shown large anomalous numbers that are of unknown origin but are likely caused by animal movement. The counters are still deployed, but were moved to new locations in January 2003.

4.2.3.1 Trail Counter Locations

The counter locations were chosen in consultation with DWR's Recreation Technical Lead with the assistance of Tom McBride of the California Department of Parks and Recreation, Lake Oroville State Recreation Area. Mr. McBride coordinates maintenance of the trail system and so is very familiar with the trails and their use. The four counter locations were selected to record use of four major sections of the trail while minimizing the chance of users crossing the counter beam side-by-side (to avoid undercounting). The counters are mounted on tree trunks a few feet off the trails. Each counter is near a trailhead or road crossing to facilitate field staff access to them, and is set back from the trail to minimize detection and possible tampering.

Two counters were located in the Loafer Creek area: one on the North Loop (Roy Roger Trail) and the other on the South Loop. These two locations are separated by about ¼ mile and are on opposite sides of the main entry road into the area. It is possible for users of these trails to cross both counters on the same outing, although most would be expected to use one loop or the other. The South Loop trail connects to the nearby equestrian camp, thus many use counts would be expected to come from horse riders. The South Loop trail is also close to the group campground in Loafer Creek.

The third counter is located on Kelly Ridge, directly across the Bidwell Canyon entry road from the Bidwell Canyon Campground. The counter was positioned about 100 yards from the roadway and before a split in the trail. Thus, trail users coming from either path on Kelly Ridge would cross the counter if they continue a short way beyond the split. Also, trail users who come to the Kelly Ridge area from the Saddle Dam Trail Access would be recorded. The Kelly Ridge area is adjacent to a densely developed residential area as well as the campground, making this counter location unique from the other three locations.

The fourth counter is on the Dan Beebe Trail off of Oroville Dam Boulevard, upslope from the Diversion Pool roughly across from the bottom of the Oroville Dam spillway. This trail runs adjacent to the south side of Diversion Pool and can be accessed from a nearby small parking area along Oroville Dam Boulevard and from trailhead parking areas to the east and west. The trail connects with the Lakeland Boulevard Trail Access, a trailhead used by horse riders, bike riders, and runners from the local schools.

4.2.3.2 Trail Counter Data Recorded

The trail counter design requires that a docking station and laptop computer be brought to each counter in order to download data in the field. The memory cards are not removable. Unless erased, the data remain in the counters' memory after the download. The counters have sufficient memory to record nearly a year of hourly counts.

Each counter has been programmed to record both the total number of trail users crossing of the counters' infrared beam each hour, and the number of count "events," each of which corresponds to crossings that occur within a set number of seconds of each other. For example, as currently programmed, five hikers that cross the counter within 15 seconds of each other would be recorded as one "event". Each "event" represents one user group. Any counts that are generated outside the 15 second lockout-time will initiate another event number. The counters do not record the number of users in a group, but the data show how many separate groups have crossed the counter in each hour or day.

4.2.3.3 Counter Data Download Procedure

Data are downloaded from the counters approximately every 10-14 days. The data sets have four items per line: a date stamp giving day, month and year; a time stamp, incremental in hourly intervals; a count for that hour of tabulation; and an "event" count. The data sets are created in a spreadsheet format and can show a synchronous timed display of the measured activity on all four trail areas. For counters near to each other, the data may show a group moving through the trails and causing the same count patterns in different trail sections. Downloaded data are transferred to an Excel spreadsheet for analysis.

4.2.3.4 Summary of Trail Counter Data

Table 4.79 reports monthly total and average counts for the four trail counter locations. The data summarized cover the 97 days for which a full day of hourly counts is currently available. Overall, the Bidwell Canyon location received the most use over this period, with the exception of October when the Loafer Creek counter locations recorded considerably more use. The high October use levels at Loafer Creek, however, are the result of very high use on just one or two days and are discussed in more detail below.

Table 4.79 Summary of Trail Counter Data for the Period of August 24 to November 28, 2002

	August (8 days)		September (30 days)		October (31 days)		November (28 days)	
	Total Count	Daily Average	Total Count	Daily Average	Total Count	Daily Average	Total Count	Daily Average
Loafer Creek – S. Loop	63	7.9	247	8.2	335	10.8	310	11.1
Loafer Creek – N. Loop	78	9.8	310	10.3	331	10.7	178	6.4
Kelly Ridge Area	206	25.8	543	18.1	414	13.4	536	19.1
Dan Beebe Trail	28	3.5	228	7.6	272	8.8	248	10.3

Note: The data summarized here covers the 97 days between August 24 and November 28, 2002, with the exception of the data for the Dan Beebe Trail counter, where the last full day of data is for November 24, 2002. Although the trail counters collected hourly counts 24 hours a day, only counts recorded between 6:00 a.m. and 6:00 p.m. are reported. Nighttime counts are not reported due to a high likelihood of being caused by deer and other wildlife.

Three of the four trailheads showed low total user counts for late August (63 users at South Loop Loafer Creek, 78 users at North Loop Loafer Creek, and 28 users at Dan Beebe at Spillway) and all three locations averaged less than 10 users per day. However the counter at Bidwell Canyon recorded a much higher count of 206 users, an average of about 26 per day.

In September, the daily average amount of use remained constant at both of the Loafer Creek locations, with 8 and 10 users per day on the South and North Loops, respectively. The Bidwell Canyon location again recorded the highest user count with 543 users and the largest average of about 18 users per day. Use at the Dan Beebe Trail location remained the lowest of the four, but about doubled from the August average to nearly 8 users per day.

All but the Bidwell trail counter recorded moderately increased user counts in October compared to September. The trailhead at South Loop Loafer Creek showed the biggest increase, rising from 247 counts in September to 335 counts in October, and increasing its average user count from about 8 per day in September to about 11 per day in October. The total amount of use and average users per day was nearly the same for the North Loop. Daily use recorded on the Dan Beebe trail was only slightly higher than during August and September and it remained the least-used trail section of the four. Use dropped somewhat at the Bidwell Canyon location in October to 414 users, about 13 per day, but that location again recorded the most monthly use.

Data for all but the last two days of November were downloaded for the South Loop Loafer Creek, North Loop Loafer Creek, and Bidwell trailheads, and for all but the last six days of November for the Dan Beebe trail location. (The counters continued to operate and counts for the remaining days of November will be available in the future.) Use counts went down by about two-thirds for both of the Loafer Creek trails, to about 11 users per day on the South Loop and just over six users per day on the North Loop. At the Bidwell Canyon location, use rebounded to a level similar to that recorded in September, with over 530 counter crossings recorded for the month. At the Dan Beebe counter location, daily use increased slightly from the previous two months to just over 10 users per day.

Subsequent analysis of these trail counter data will compare weekend and weekday use at all four locations.

4.3 RESERVOIR BOATING STUDY RESULTS

A primary purpose of the Reservoir Boating Study is to document the amount and character of boating activity on the four reservoirs in the study area – Lake Oroville, Thermalito Forebay, and Thermalito Afterbay. This documentation has been accomplished through a series of field observations. Most of the observations document traffic during peak use conditions – i.e., summer weekend and holiday afternoons.

On Lake Oroville, the observations were conducted from a boat moving through zones of the reservoir. For the purpose of these observations, Lake Oroville was divided into 6 zones. Because it was not possible to conduct observations on the entire reservoir in a reasonably short period of time (within 2 to 3 hours), only 1 to 3 zones were covered each time a boat went out to conduct counts. The survey boat proceeded through the count zones as fast as was practical while allowing boats to be observed and their location and type marked on a map of the zone. One person drove the boat while another conducted the observations and recorded them, with assistance from the driver to count boats on the shore in heavily used areas.

On the Forebay, Afterbay, and Diversion Pool the observations were conducted from vantage points on bridges crossing the reservoirs and from shoreline locations. In all areas, binoculars were used when necessary to find and identify the type of distant boats.

Although a precise evaluation of count accuracy cannot be provided, it is believed that the counts obtained using these methods are within +/- 5% of the actual number of boats present. The counts do not represent a “snapshot” of use since boats would have entered and left the count zones during the hour or more that the count was in progress. The counts are likely to be most accurate for areas of the lake beyond the two-mile-wide main basin (Figure 2), where boats are more easily seen. Locations and times with the lightest use are also likely to produce the most accurate counts. High amounts of moving boat traffic in some areas presented the most difficulty for observers and could have lead to the chance for error. Also, boats already counted can overtake the surveyors’ boat and be mistakenly re-counted. Boats not yet counted in a zone can be missed if they go to an area already surveyed while the surveyors are still occupied in a subsequent cove. Some of these types of errors may offset each other out to some extent.

The tallies of boats by type as presented in the tables below were derived from the maps used to record the field observations. Letters were used to mark the location of specific types of boats on the maps. For example, an R indicated a runabout, an F a fishing boat, and an H a houseboat. Each boat observed was also identified as being in active use (moving or stationary but away from shore) or beached on or moored to the shore. This identification was done because a high proportion of boats in some areas were known to spend most of the day on-shore or moored (this is true of houseboats in particular). This distinction will be important in analyzing the effect of boat traffic on crowding and reservoir carrying capacity.

In subsequent analyses, boat traffic density (the number of acres of water available to each boat observed) will be calculated for each zone, taking into account the reduced

surface area of Lake Oroville as the water levels falls throughout the summer boating season. Also, maps will be produced to depict boating use in each zone during the counts.

4.3.1 Numbers, Types and Distribution of Boats on Lake Oroville

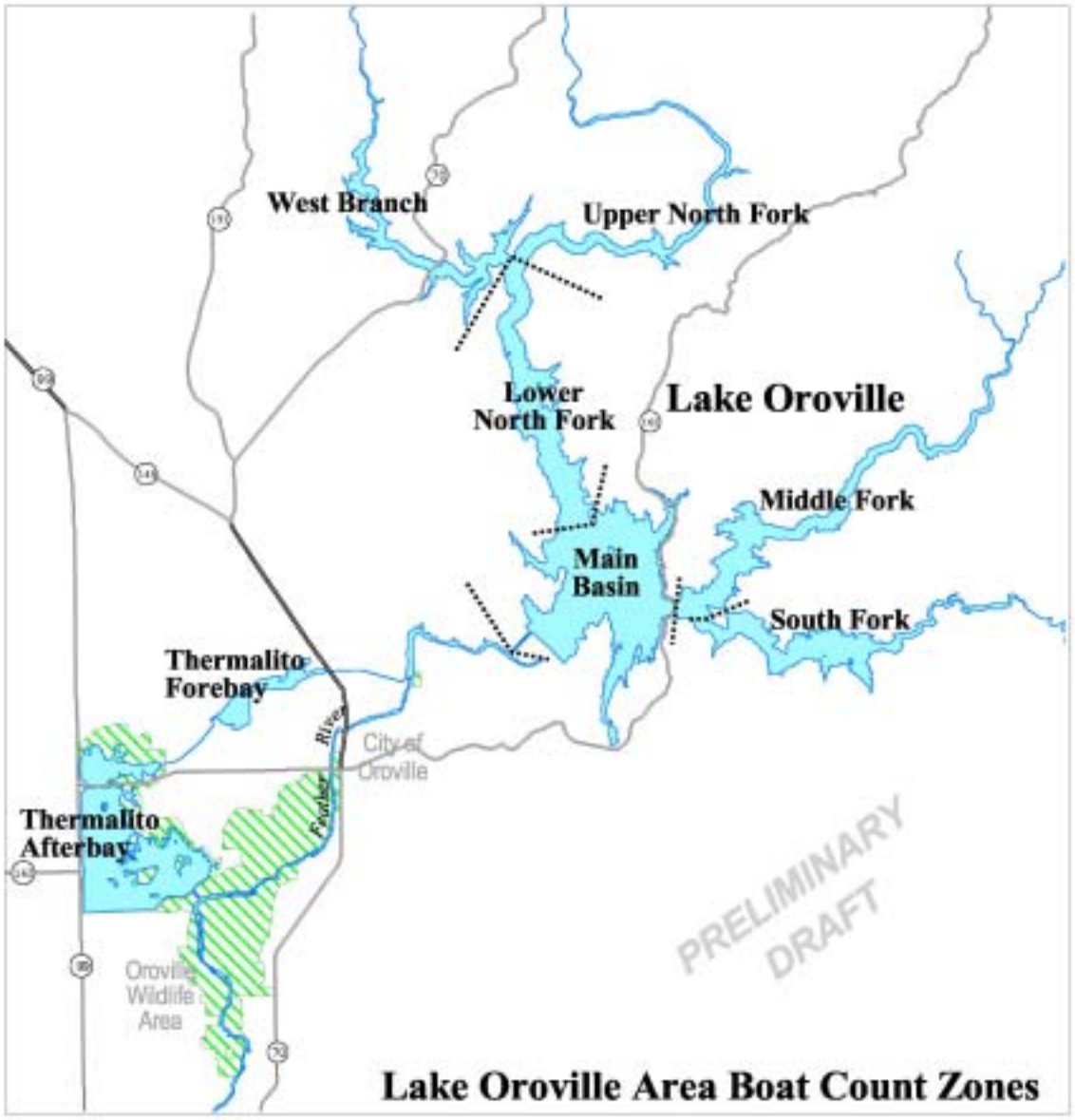
A total of 22 counts were completed on Lake Oroville during peak use hours (see Table 4.80). From two to five counts were conducted on each of the six Lake Oroville zones (Figure 2). Most counts were begun between noon and 5:00 pm. A few counts conducted on weekends with high boating activity were started at 11:00 am, but extended into the afternoon. Each count took from 30 minutes to 1.5 hours to complete, depending on the length of the zone and amount of boat traffic present.

Table 4.80 Results of Counts of Boats on the Water on Lake Oroville

Date	Location/ Lake Zone	Start Time	Runabouts/ Ski boats	Personal Watercraft	House-boats	Fishing boats	Pontoon boats	Non-powered boats	TOTAL
16-Jun	Main Basin	11:00	34	2	6	5	2	3	52
6-Jul	Main Basin	12:00	25	4	12	13	0	3	57
3-Aug	Main Basin	2:00	23	2	8	0	2	12	47
31-Aug	Main Basin	1:45	42	21	18	6	8	4	99
25-May	Middle Fork	3:30	163	21	77	8	0	7	276
1-Sep	Middle Fork	2:00	141	39	90	9	6	5	290
27-May	South Fork	4:00	25	4	14	7	3	2	55
1-Sep	South Fork	5:00	73	26	45	4	4	3	155
27-May	Lower N. Fork	11:00	19	0	10	3	1	5	38
16-Jun	Lower N. Fork	2:00	26	6	4	6	3	0	45
3-Aug	Lower N. Fork	4:00	20	4	4	0	3	0	31
10-Aug	Lower N. Fork	1:30	42	3	4	1	1	0	51
31-Aug	Lower N. Fork	4:00	46	12	7	7	3	1	76
16-Jun	Upper N. Fork	3:00	31	0	3	12	0	0	46
3-Aug	Upper N. Fork	4:30	31	2	2	2	0	0	37
10-Aug	Upper N. Fork	2:30	30	1	1	1	3	0	36
2-Sep	Upper N. Fork	2:20	21	3	1	1	2	0	28
26-May	West Branch	12:00	25	4	11	10	1	0	51
16-Jun	West Branch	3:30	16	10	9	8	0	0	43
3-Aug	West Branch	5:10	28	9	12	2	2	2	55
10-Aug	West Branch	4:00	37	6	13	3	3	2	64
2-Sep	West Branch	1:15	18	5	11	5	1	0	40

Note: Non-powered boats include sailboats, canoes, and kayaks.

Figure 2. Lake Oroville Boat Count Zones



4.3.1.1 Main Basin

Four counts were conducted on the main basin between mid-June and the end of August. The counts began between 11:00 am and 2:00 pm. The final count, on August 31, fell on the 3-day Labor Day holiday weekend. Most of the Bidwell Canyon cove is occupied by the marina and few boats go to the back of the cove beyond. Therefore, the

counts on the Main Basin began at the buoy line north of the Bidwell marina and continued in a circular fashion around the basin. This zone also contains three of the four major boat launch facilities on the lake.

The total number of boats observed was fairly consistent for the first three counts, ranging from 47 to 57 boats. Observed boat traffic was about double during the last count at 99 boats. Runabouts, ski boats, and similar pleasure boats were the most numerous types present during all counts, typically comprising 40-60% of boats. Few personal watercraft were observed during the first three counts, but 21 were observed during the final count. The main basin is the most popular area for sailboats (categorized as non-powered boats), due to the open character of the area and unimpeded winds.

4.3.1.2 Middle Fork

Two counts were completed on the Middle Fork zone, one during the Memorial Day weekend and one during the Labor Day weekend. Both were conducted in the middle of the afternoon. Counts began at the Hwy. 162 bridge and proceeded upstream. A lengthening portion of the upper end of the zone becomes shallow and inaccessible to boats as the lake level drops through the summer.

Nearly 300 boats were observed during both of the counts, making this zone the most heavily used portion of the lake. About one-half of the boats observed were runabouts/ski boats. Houseboats were also quite numerous, with 77 observed during the first count and 90 during the second, equal to about 30% of the boats using the area. They were primarily observed moored along the shore in the several large coves toward the west end of the zone, in particular in Sycamore Creek cove.

4.3.1.3 South Fork

Two counts were completed on the South Fork zone, again with one completed during the Memorial Day weekend and one during the Labor Day weekend. Both were conducted in the late afternoon. Counts began at the mouth of the fork, about one-half mile upstream of the Hwy. 162 bridge, and proceeded upstream. As is the case with the Middle Fork, the upper end of the zone (beyond the Lumpkin Road bridge) becomes mostly dewatered and unnavigable as the lake level drops during the late summer.

In both instances, observed boat traffic was much lower than what was seen on the Middle Fork the same weekends. Only 55 boats were observed on Memorial Day, but nearly three times that many were observed on the Labor Day holiday weekend. Like the Middle Fork zone, about half the boats were runabouts/ski boats but houseboat use was also substantial, particularly on the shoreline of the large cove just upstream of Craig Saddle. Nearly 30 personal watercraft were also observed during the Labor Day weekend count.

4.3.1.4 Lower North Fork

The Lower North Fork zone, called “the chute” by some lake users, is a narrow segment extending several miles from the upper main basin to the confluence with the West Branch. Five counts were completed, each starting between 11:00 am and 4:00 pm. One count occurred on Memorial Day, one occurred in mid-June, two occurred in early August and the last occurred during the Labor Day holiday weekend.

The amount of boat traffic observed was roughly the same for the first four counts, ranging from about 30 to 50 boats. Use by 76 boats was observed during the count on

August 31. About two-thirds of the boats observed were runabouts/ski boats during all the counts. Ten houseboats were seen during one count and one dozen personal watercraft were in the area during another count.

4.3.1.5 Upper North Fork

The Upper North Fork zone is a narrow zone curving upstream from the confluence with the West Branch for more than 10 miles. Four counts were completed in this zone between mid-June and September 2, the Labor Day holiday. All were done in the mid- or late afternoon.

The highest amount of use was observed during the first count on June 16, with 46 boats observed. Use was somewhat less but similar during the latter three counts with 28 to 37 boats observed. Nearly all of the boats observed during each count were runabouts/ski boats, although 12 fishing boats were observed on June 16. Other types were few in number (less than three present) during all the counts.

4.3.1.6 West Branch

The West Branch zone extends from its confluence with the North Fork upstream more than five miles. Like the Upper North Fork zone, it is narrow and sinuous. However it contains several long narrow coves, such as those at Dark Canyon and Vinton Gulch. The Lime Saddle marina occupies a large portion of the middle of the zone, with moored houseboats covering several acres. The Lime Saddle boat launch ramp is adjacent to the marina.

Five counts were completed in the West Branch zone between Memorial and Labor Day weekends. The counts were started between noon and about 5:00 pm. The number of

boats observed using the area was within a narrow range, from 43 to 64. About one-third to one-half of the boats were runabouts/ski boats during each count. Owing to the proximity of the marina and the sheltering coves, about 10 to 12 houseboats were active in the area during each count. As many as 8 to 10 personal watercraft and a similar number of fishing boats were recorded on several different occasions.

4.3.2 Numbers, Types, and Distribution of Boats on Thermalito Forebay and Afterbay and Diversion Pool

A total of 13 counts were completed on weekend and holiday afternoons on the Thermalito Forebay and Afterbay (see Table 4.81). In most instances, the counts were done consecutively on the two reservoirs, one immediately after the other. A vantage point near the Nelson Road bridge at the narrow mid-point of the Forebay was used to observed boat traffic in that area. Motorized boating is allowed only on the area to the south of the bridge. For the Afterbay, vantage points at the Wilbur Road boat ramp, on the Hwy. 162 bridge, and at the Larkin Road car-top area were used.

Table 4.81 Results of Counts of Boats on the Water on Thermalito Forebay and Afterbay

Date	Location/ Lake Zone	Start Time	Runabouts/ Ski boats	Personal Watercraft	House-boats	Fishing boats	Pontoon boats	Non-powered boats	TOTAL
27-May	Forebay	6:00	5	7	0	1	0	0	13
15-Jun	Forebay	2:00	3	2	0	0	0	0	5
22-Jun	Forebay	1:30	3	2	0	0	0	1	6
4-Jul	Forebay	3:30	6	4	0	0	0	0	10
13-Jul	Forebay	3:15	0	0	0	0	6	0	6
11-Aug	Forebay	5:10	0	2	0	0	0	1	3
1-Sep	Forebay	3:15	1	5	0	0	0	8	14
15-Jun	Afterbay	2:30	6	6	0	0	0	1	13
22-Jun	Afterbay	2:15	9	3	0	0	0	0	12
4-Jul	Afterbay	4:00	20	13	0	0	0	3	36
13-Jul	Afterbay	3:45	6	9	0	2	0	0	17
11-Aug	Afterbay	3:30	18	16	0	5	0	0	39
1-Sep	Afterbay	2:15	36	32	0	0	0	0	68

Note: Non-powered boats include sailboats, canoes, and kayaks.

4.3.2.1 Thermalito Forebay

The number of boats on the Forebay was never observed to be higher than 14, and as few as three boats were observed during one count. Nearly all of the boats observed during all the counts were runabouts, ski boats, or personal watercraft. Eight paddle and sail-powered boats were observed on the upper section on September 1; only one non-powered boat was present at any other time.

4.3.2.2 Thermalito Afterbay

Use of the Afterbay was not usually observed to be high, but it was considerably greater than use observed on the Forebay. Nearly 40 boats were observed on the July 4th holiday and on August 11. The peak count was 68 boats observed on September 1. Use may have increased late in the season due to the relatively low level of Lake Oroville. On those three days when use was greatest, about equal numbers of runabouts/ski boats and personal watercraft were present. (Personal watercraft users are attracted to the small beach are next to the Monument Hill boat launch.) A few fishing boats were also observed during two of the counts.

4.3.2.3 Diversion Pool

The research team visited the Diversion on four weekend days between mid-June and September 1, 2002 to observe boating activity. Three of these occurred in late afternoon and one at mid-morning. The observers' vantage point on the Burma Road above the bend in the Diversion Pool allowed complete observation downstream toward the Diversion Dam but less complete observation upstream toward Oroville Dam. Boats more than about ½ mile upstream from the bend might not be seen. No boats were observed during any of the four observations. (One or two canoes or similar boats were observed during some of the visitor survey and use monitoring visits.)